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Original Articles.

CASES OF CEREBROSPINAL FEVER IN THE ROYAL NAVY.—AUGUST 1, 1915, TO JULY 31, 1916.

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The following analysis of the cases of cerebrospinal fever in the Royal Navy during the second year of the war may serve as an addendum to the Report[1] on those occurring during the previous year. Some of the etiological points dealt with at length in the previous Report such as overcrowding, the spread of the disease by carriers, the influence of influenza and catarrhal affections, and of meteorological conditions, and prophylaxis, have not been taken into consideration again. The present Report contains:—

(1) Remarks on the incidence of the cases.
(2) Remarks on some clinical aspects.
(3) A summary of the results of treatment.
(4) A brief history of the outbreaks at various centres.

(1) Incidence of the Cases.

During the year August 1, 1915, to July 31, 1916, there were 104 cases of cerebrospinal fever in the Royal Navy, as compared with 170 cases during the first year of the war. This fall in the

[1] This Journal, 1915, vol. i., pp. 373-407.

number of cases must be correlated with the contemporaneous fall in the incidence of the disease both in the civil population and also in the Army in this country[1]. Although the fall in the general incidence of the disease is probably the main factor in the smaller incidence in the Navy, it should be borne in mind that great care has been taken in prophylaxis and that in the first half of 1916 bacteriological examination of swabs from the throats of new entries was made at Haslar, Chatham, Plymouth and at Greenwich of non-contacts (new entries and drafts for sea) in order to detect carriers' (*vide* pp. 13, 16, 17). Out of 10,852 ratings examined 298, or 2·7 per cent., carriers were thus detected and isolated. Not only has the incidence been smaller but it has been less widespread for no case occurred at Blandford Camp or in the Akbar Establishment in both of which there were a few cases during the first year of the war. At the Deal Depot, which was responsible for twenty-five cases during the first year of the war, there were two cases only in the second year. No case of proved meningococcic meningitis has occurred during the last two years at Osborne or Dartmouth.

The monthly incidence with the results is shewn below. As in the first year of the War, the largest number of cases and of deaths occurred in February.

		Cases	Deaths		Recoveries
1915	August	4	2 or 50·0 per cent.		2
	September	4	3 „ 75·0		1
	October	3	1 „ 33·3		3
	November	6	5 „ 83·3		1
	December	8	4 „ 50·0		4
1916	January	8	3 „ 37·5		5
	February	26	7 „ 30·9		19
	March	20	6 „ 30·0		14
	April	7	1 „ 28		6
	May	7	0 „ —		7
	June	3	1 „ 66·7		1
	July	8	2 „ 25·0		6
		104	37		67

Age Incidence.—Among the 104 cases in the Navy 70 or 67·3 per cent., were under 20 years of age (83 or 79·8 per cent. being under the age of 25 years) and the number of cases progressively diminished in the succeeding decades. The percentage

[1] For this information I am indebted to Surgeon Colonel R. J. Reece, R.A.M.C. of the Local Government Board.

of deaths was lower under 20 years than in [illegible] the succeeding decades The average age of the 101 cases was [illegible] years, of the fatal cases 22 3 and of the recoveries 19 4 years The extremes of age were 15 and 46 years

Age periods	Number of cases and percentage of the total 104 cases	[illegible]
15 to 19	70 or 67 1 per cent	[illegible]
20 ,, 25	21 ,, 20 1	[illegible]
31 ,, 35	6 ,, 5 8	[illegible]
36 ,, 40	4 ,, 3 8	[illegible]
	104	[illegible]

The case which recovered was invalided and died subsequently [illegible] the coroner's inquest finding pneumonia was the cause of death

In the first year of the war 60 6 per cent of the cases were under 20 years of age

Mortality —Out of the 104 cases 37, or 35 6 per cent, proved fatal this contrasts favourably with the mortality of 90, or 52 9 per cent among the 170 cases during the first year of the war

Ranks and Ratings —There were two officers—a midshipman Royal Naval Reserve (aged 18) and a surgeon probationer (aged 21) who both recovered The 102 ratings were as follows Boys (seamen class) 39 (7 deaths) seamen 22 (11 deaths), stokers 13 (6 deaths) marines 11 (3 deaths) engine-room artificers 5 (2 deaths) officers stewards 3 (all fatal average age 20 years), carpenter's crew 2 (1 death), boy servants 2 (1 death) cooks mate 1 (recovery), plumber's mate 1 (recovery) armourer's crew wireman 1 (fatal) trimmer 1 (recovery) boy artificer 1 (fatal)

(2) Remarks on some Clinical Aspects

Onset —The mode of onset sometimes varied from the common form characterized by fever, malaise headache and vomiting Eight patients when first discovered were in an unconscious condition and three of these had fallen out of their hammocks one of these with a graze on the forehead blood about the nostrils and vomiting was regarded for some days as a case of fractured base Of the eight cases with this apoplectiform onset four proved fatal In four cases in February respiratory symptoms were so well marked as to suggest pneumonia or acute bronchitis In one case the prominence of abdominal symptoms gave rise to an initial diagnosis of appendicitis

In eleven cases at least the disease began very shortly (within

three days) after coming on leave (six cases), or returning from leave (five cases) and in [illegible] instances considerable fatigue must have been entailed by the length of the journey. In one instance the disease appeared three days after arriving on leave at Gosport from the Grand Fleet. In the five cases in which the disease appeared shortly after returning from leave, the question of infection when on leave arises. In thirteen cases the disease occurred within three weeks of joining the Service and exposure to the trials incident to this change of life. In three cases the disease followed the onset of measles after an interval of about ten days, as these cases were already under observation in hospital it is improbable that the initial mottled rash of cerebro-spinal fever was regarded as measles. In two other cases the disease attacked patients already in hospital for a lacerated finger and pleurisy respectively. In five cases (four fatal) meningitis in which the cerebro-spinal fluid was proved bacteriologically to contain meningococci, supervened on otitis. In isolated instances drunkenness and head injury (one case) influenza and vaccination (four cases) immediately preceded the onset. In one case pneumonia and cerebro-spinal fever co-existed.

These various factors may have so reduced the bodily resistance as to enable the prophytic meningococci in the nasopharynx to invade the system.

Rashes were recorded in 51 or 49 per cent. out of the 104 cases, in 11 cases the rash was petechial or haemorrhagic and in 40 or 38·6 per cent. In the proved fatal a mortality percentage very little higher than that (41·6) of all the 104 cases. In one case with a petechial eruption haemorrhagic bullæ appeared on the ankles four days after the rash. In five cases there was a macular rash with one death and in five cases a rose rash with one death. The mortality of the 51 cases with rashes was, therefore, 17 or 33·3 per cent. scarcely slightly lower than the mortality of the total 104 cases. In the first year of the War rashes occurred in 102, or 62·6 per cent. of 164 cases and the mortality of the cases with rashes was 52 (51 per cent.) or a little lower than that (52·9) of the total 170 cases. Although a very profuse hæmorrhagic rash is extremely common the occurrence of a rash is not necessarily of grave significance. The rash was nearly always noticed on the first or second day of the disease.

Herpes was noted in 21 or 20·2 per cent. of the 104 cases in 20 cases the herpes was on the lips in the remaining case it was in the distribution of the nasal branch of the ophthalmic division of the fifth nerve but the cornea was not affected. In one of the cases with labial herpes there was also

[illegible] herpes In 11 [illegible] in 2 cases the rash and the labial herpes both occurred on the second day of the disease, in the remaining cases the herpes appeared later than the rash on an average on the fourth day of the disease the extremes being the second and the eighth days In some instances the labial herpes was very profuse Of the 21 cases 4, or 19 per cent proved fatal this mortality is nearly half that (35 6 per cent) of the total 104 cases and thus agrees with the ancient belief that herpes in cerebro-spinal fever as in pneumonia is a good prognostic In the previous year herpes labialis was noted in 39 or 21 5 per cent of 183 cases—almost exactly the same proportion is in the present series

Rarer Manifestations and Complications—Ocular symptoms Photophobia which has been stated to be rare was noted in 10 cases conjunctivitis in 5, conjunctival hæmorrhage in 2 panophthalmitis with loss of an eye in 2 strabismus in 3 (3 fatal) ptosis in 3 (2 fatal) nystagmus on the second day in 1 (fatal) and von Graefe's sign in 1 Hemiplegia occurred in 1 case and weakness of the arm in another case, both of which were fatal facial paralysis in 1 (fatal), dysarthria in 1 (recovery), and dysphagia in 1 (recovery) Delirium tremens occurred in 2 cases (1 fatal) Pericarditis was noted in 2 cases both of which recovered Recent endocarditis was found after death in 1 case (*vide* p 12) and transient systolic murmurs were heard in 4 cases which recovered Status lymphaticus was found after death in 1 case Hæmaturia due to hæmorrhagic cystitis and pyelitis was seen in 1 case, and 1 patient had polyuria for a few days, passing 8, 6 and 4 pints of urine daily, while the temperature was about 103°F Epididymitis without any evidence of gonorrhœa occurred once.

Synovitis was noted in 1 cases (2 fatal) on the second, fifth and sixth days of the disease in 2 cases the knee was affected, in 1 the ankles and wrists, and in 1 the interphalangeal joint of a finger All the cases had a petechial or hæmorrhagic eruption this fits in with the view that when purpura and synovitis are associated, the latter is due to hæmorrhages into the synovial membrane In the case with arthritis of the wrists and ankles on the fifth day of the disease pericarditis with synovitis of the wrists ankles and knees developed on the ninth day in spite of delirium tremens recovery followed In the first year of the War there were 8 cases (2 fatal) of arthritis Acute otitis supervened in 2 cases, both of which recovered

[1] Foster and Gaskell Cerebro-spinal Fever p 37 1916 Cambridge

Relapses during treatment are said not to be uncommon and generally to occur in cases of chronic hydrocephalus which terminate fatally. There was one case proved to be of this nature in a man aged 19, the relapse which started after nine days of convalescence being ushered in by a rigor. In one case a true relapse or brief second attack occurred seven weeks after the temperature had been normal and was followed by recovery (*vide* p. 11).

Mixed infections of the cerebrospinal fluid were reported in three cases: pneumococci in one case without any obvious focus and streptococci in two cases (one an otitic case in the other infection occurred through the lumbar puncture).

The manifestations of serum disease are dealt with on p. 10.

Diagnosis.—Only those cases in which meningococci were found in the cerebrospinal fluid have been accepted as cerebrospinal fever. In other words lumbar puncture and examination of the cerebrospinal fluid have been regarded as necessary for diagnosis. This criterion has very probably led to the rejection of some genuine cases of cerebrospinal fever. But no clinical manifestation is pathognomonic of the disease. Thus a hæmorrhagic rash though highly suggestive was present in cases proved bacteriologically to be due to other infections such as pneumococci or to be free from micro-organisms. The latter group of cases though unsatisfactory must be recognized.[1]

A fulminating case of meningitis with a profuse hæmorrhagic rash occurred on November 7, 1915, in a cadet at Dartmouth. Bacteriological examination of the cerebrospinal fluid which was almost clear and contained a few red blood cells and occasional polymorphonuclear leucocytes by Fleet Surgeon H. W. Whiteside, R.N., failed to show any micro-organisms; the cultures were sterile, and no carriers were detected among thirty contacts. There was no necropsy. A brother died in infancy from meningitis believed to be tuberculous.

Cases with meningeal symptoms, which showed meningococci in the nasopharynx but not in the cerebrospinal fluid have been ruled out as they may have been meningococcic carriers with meningismus due to some other cause. In this connexion it may be pointed out that during the acute stage of cerebrospinal fever swabs from the nasopharynx are often negative. Out of 13

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[1] Among 120 cerebrospinal fluids from cases of meningitis in the French Army, Sacquépée, Burnet, and Weissenbach (*Bull. et Mém. Soc. Méd. Hôp.*, Paris, 1915, xxxix. 103-105) found six with the features of Widal's pluriform aseptic meningitis, in which no micro-organisms could be found by direct examination or by culture.

... were found in the ... This corresponds with von Lingelsheim's ... cerebrospinal fever with 14% or 22 per cent ... from the nasopharynx[1].

Cerebral symptoms (meningism) accompanying ... such as influenza pneumonia enteric ... closely imitate cerebrospinal fever and a certain diagnosis ... only by lumbar puncture and examination ... spinal fluid. Even if a patient has signs of pneumonia ... shown by isolated cases in both the recent epidemic in Nova ... that there is meningococcic meningitis as well.

From other forms of meningitis lumbar puncture and examination of the cerebrospinal fluid constitute again the most reliable method of diagnosis. Even with pre-existing otitis ... not necessarily follow that meningococcic meningitis can be excluded for, as mentioned on p. 4 in five cases (four fatal) in Glasgow in which the cerebrospinal fluid was proved bacteriologically to contain meningococci, supervened on otitis.

Difficulty might arise in the diagnosis from the meningitic form of acute poliomyelitis in which all the symptoms of meningitis may be present but "on lumbar puncture the cerebrospinal fluid escapes under pressure is clear and on cytological examination may be found to contain an increased number of lymphocytes with a normal or sometimes a diminished sugar reaction and an increased amount of albumin" (Batten[2]). An outbreak in Devonshire and Cornwall in 1911 of what was at first thought to be cerebrospinal fever was shown by R. J. Reece[3] to be one of acute poliomyelitis and not one of acute poliomyelitis occurring concurrently with cerebrospinal fever. In July 1916 there was at Shotley (vide p. 18), an outbreak of fifteen cases with the clinical symptoms of cerebrospinal fever but four only were proved to be of this nature. Among the remaining eleven cases there was one only which could be regarded as an example of the meningitic form of acute poliomyelitis.

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[1] Quoted in the Report of the Special Advisory Committee upon Bacteriological Studies of Cerebrospinal Fever during the Epidemic of 1915, p. 10.

[2] Batten, F. E.: Acute Poliomyelitis, p. 88. 1916. John Bale Sons and Danielsson, London.

[3] Reece, R. J.: Report of the Medical Officer of the Local Government Board, 1911-12. Appendix A. No. 4, p. 51. 1913.

In acute osteomyelitis of the spine lumbar puncture may give exit to pus from the extradural space This occurred in two cases in the Royal Navy which will subsequently be published In neither of these were there definite symptoms of cerebrospinal fever but Grisel[1] in a review of this form of osteomyelitis states that although in some cases the symptoms of compression are quite definite and disappear when the abscess is evacuated, there are others in which the association with meningitic symptoms and septicæmia renders the diagnosis very difficult

The sequence of events in the two following cases is, perhaps, worthy of brief mention

Two brothers from the Fair Isle Shetland, had measles in September, 1915 in Haslar One developed cerebrospinal fever ten days after the onset of measles and died The other who had never been well since the attack of measles died in Haslar three months later from tuberculous meningitis In both cases a post mortem examination was made

(3) Summary of the Results of Treatment

Two out of the 104 cases were discovered after death only and, therefore, were not treated for the disease 1 case (fatal) received serum only, and 8 cases of which 1, or 66 7 per cent, proved fatal had lumbar puncture only Therefore, out of 9 cases which did not receive serum 7 or 77 8 per cent proved fatal

Among the 93 cases treated by some form of serum the mortality was 30, or 31 6 per cent This result which is in striking contrast to the results of serum treatment in the first year of the War—105 cases with a mortality of 64, or 61 per cent—fully justifies the serum treatment of the disease, and is compatible with the widely expressed view that the serums employed in this country during the first year of the War were largely deficient in antibodies Flexner's serum made under his direction at the Rockefeller Institute, New York, was not available during the first year of the War, but after the failure in this country of anti meningococcic serum in the epidemic of 1915 the Rockefeller Institute reverted to the manufacture of the serum, and most generously placed a supply of a multivalent serum made from thirty two strains, at the disposal of the Royal Navy[2] Other serums employed during this year and not in the previous year, are Colonel Mervyn Gordon's

[1] Grisel P *Rev d'orthop*, Paris 1911 3 ser tome II p 145 For this reference I am indebted to Temporary Surgeon L Pearce Gould M D I R C S, R N

[2] *Vide* Amoss and Wollstein "A Method for the Rapid Preparation of Anti meningitis Serum" *Journ Exper Med* N Y, 1916 vol xxiii p 103

various serums and the Pasteur Institute's multivalent serum. In the early part of the second year of the War, when the new serums were not available, Mulford's serum was given in a number of the cases, and throughout the year use was also made of the Lister Institute serum and of Burroughs Wellcome and Co.'s serum.

Of the 95 treated with intrathecal injections of serum, 60 did not receive any other form of specific treatment and had a mortality of 18, or 30 per cent., which is a little lower than that (31·6) of the 95 cases. The remaining 35 cases received in addition one or more of the following forms of treatment: hypodermic or intramuscular injection of the serum, of vaccines or of soamin, or hexamine by the mouth, with a mortality of 12 or 34·3 per cent. In 23 out of the 35 cases the additional treatment was the simultaneous subcutaneous (or in a few instances intramuscular) injection of serum: this method was mainly adopted at Plymouth and Haslar: the mortality was 7, or 30·4 per cent. Vaccines were given in 8 cases but did not appear, except perhaps in one or two instances, to exert any decided beneficial effect. The exact figures of the results of treatment are shown in the tabular form below:—

TABULAR SUMMARY OF TREATMENT.

	Cases	Deaths	Recoveries
Intracerebrospinal Serum—			
Intrathecally	95	30 or 31·6 per cent.	65 or 68·4 per cent.
Alone	60	18 30	42 70
Combined with serum hypodermically, vaccines, soamin or hexamine	35	12 34·3	23 65·7
Combined with serum hypodermically	29	7 90·4 ,,	16 55·6
Combined with vaccine	4	1 , 25	3 75
Combined with vaccine, soamin and hexamine	1	—	1
Combined with vaccine and hexamine	1	1	—
Combined with soamin	2	1	1
Combined with hexamine	2		2
Vaccines—			
(Never alone, always with intrathecal injection of serum), vide above	8	4	4
Hexamine—			
Alone	1	1	—
Combined with intrathecal injections of serum, &c., vide above	6	1	5
Soamin—			
Alone	1	1	—
Combined with intrathecal injections of serum, &c., vide above	3	1	2
Lumbar puncture (only)	6	4 or 66·7 per cent.	2 or 33·3 per cent.
Symptomatic Treatment (only)	2	2	

Many [illegible] quarters of the 9[illegible] cases recorded [illegible] within [illegible] of the sixth case From tabulation at 1 [illegible] cases [illegible] that in which the serum was given within the first [illegible] the mortality rate was 18 per cent when between the [illegible] month days 27 4 per cent, and when later than the [illegible] day 6 5 per cent and therefore laid stress on the im[illegible] of early injection In the 9[illegible] cases treated with serum in [illegible] Naval Navy this influence of time can also be seen —

	Cases	Deaths	Per cent.
[illegible] day	34	9 or 9 7 per cent	5[illegible] or 70 per cent
[illegible] day	1	5 33 3	16 66 1
[illegible] the 7th	6	9 50	3 33
	55	20 31 1	65 68 1

The results obtained by the use of the various brands of serum [illegible] in a tabular statement Flexner's serum was [illegible] in 39 cases altogether with a mortality of 9 or 23 per [illegible] In the 39 cases it was the only serum used with a [illegible] 6 or 23 per cent the 12 other cases in which other [illegible] was given as well showed a mortality of 3 or 24 per cent [illegible] were given in much fewer cases The mortality [illegible] 11 cases that received Burroughs Wellcome and [illegible] combined with other serums was slightly [illegible] The cases treated with Flexner's serum, and the [illegible] by Gordon's various serums alone showed an even [illegible]

The [illegible] occasions on which serum was given intra[illegible]ally varied in the 9[illegible] cases from one to eight according to the duration of the symptoms In some instances the improvement and fall of temperature after the injection of serum were dramatic

Sixteen cases received one dose only and 7 proved fatal 6 being very acute or fulminating cases 35 received two doses of serum (8 deaths) 22 cases three doses (7 deaths) 8 cases four doses (1 death) 11 cases five doses (1 death) 4 cases six doses (2 deaths) 4 cases seven doses (1 death) and 1 case eight doses (no death) In many cases lumbar puncture was performed more often than serum was injected In 1 chronic case in which serum was given six times, lumbar puncture was performed on 30 occasions

Serum rashes or [illegible]thematous or urticarial were mentioned in 22 or 23 per cent of the 9[illegible] cases treated by serum but may have been more frequent The rashes and articular manifestations were practically confined to cases treated with Flexner's and Burroughs, Wellcome and Co's brands

Out of the 22 cases 21 received either Flexner's or Burroughs Wellcome and Co's serum 12 had Flexner's serum alone, 2 Flexner's and

G[illegible]'s serums 1 Flexner's and the Pasteur Institute's serums 2 Burroughs, Wellcome and Co.'s serum alone 1 Burroughs, Wellcome and Co.'s and Gordon's serums and 3 Flexner's and Burroughs Wellcome and Co.'s serums (only 1 cases had this combination) The remaining case had 70 c.c. of Gordon's serum and did not have any manifestations of serum disease except the rash Out of the 9[illegible] cases treated with serum, 41 had Flexner's or Burroughs Wellcome and Co.'s serum and among them rashes occurred in 21 or 51 per cent whereas among the remaining 61 cases treated by serum there was a rash in one case only Six of the 23 cases with rashes also had serum hypodermically The average amount of serum received by the cases with rashes was 60 c.c. and the average amount received by 14 other cases which had Flexner's or Burroughs Wellcome and Co.'s serum and recovered was 70 c.c., or practically the same

TABLE SHOWING RESULTS OF TREATMENT BY DIFFERENT SERUMS

	Cases	Rash	Recovered
Flexner's serum alone	27	5 or 23 3 per cent	21 or 77 7 per cent
Combined with other serums	13	1 or 25	12 or 75
	28	9 or 28 per cent	33 or 17 per cent
Gordon's serums alone	16	3 or 18 7 per cent	13 or 81 3 per cent
Combined with other serums	6	3 or 50	3 or 50
	22	6 or 27 3 per cent	16 or 72 7 per cent
Pasteur Institute's exhausted serum (36[illegible]) alone	9	4 or 44 4 per cent	5 or 55 5 per cent
Combined with other serums	5	1 or 20	4 or 80
	14	5 or 35 7 per cent	9 or 64 3 per cent
Burroughs Wellcome & Co. serum alone	7	3 or 42 8 per cent	4 or 66 7 per cent
Combined with other serum	8	1 or 12 5	7 or 87 5
	15	4 or 26 4 per cent	11 or 73 3 per cent
Mulford's serum alone	10	1 or 10 per cent	9 or 90 per cent
Combined with other serums	2	1	1
	12	2	[illegible]
Haslar Hospital serum alone	11	1 or 9 1 per cent	[illegible] per cent

On an average the rash appeared ten days after the first injection of serum In a case at Haslar which received one injection of 20 c.c. of Flexner's serum in a relapse seven weeks after the primary attack in Egypt there was within a few hours an immediate serum rash The patient stated that nine lumbar punctures had been performed in the primary attack, but there is no official information as to the administration of serum

Of the 22 cases none proved fatal, but as the serum rash occurs after an interval of about ten days, the fulminating and acute cases are obviously excluded, and this observation has no

prognostic value Six cases had both herpes and a serum rash nine cases an initial rash and a serum rash and three cases an initial rash herpes and a serum rash (in one case on two occasions) presumably in these instances the skin was especially prone to react

In some cases pains in the joints without effusion accompanied the serum rash, and in two instances effusion into the joints and a temperature of 102° F coincided with the rash In two cases at Chatham temporary deafness occurred at the same time as a serum rash and arthalgia, and was regarded by Temporary Surgeon A C MacAllister as a manifestation of serum disease

Grave accidents due to intrathecal injection of antimeningococcic serum were very rare

In one case lumbar puncture was done directly after admission to the Royal Naval Hospital Plymouth and 50 c c of turbid fluid containing meningococci spurted out 15 c c of Gordon's multivalent serum was given intrathecally and the same quantity hypodermically Respiration stopped at once The necropsy showed fibrinous adhesions and purulent streaks over the cerebral sulci, with but little exudation at the base of the brain Both lateral ventricles were distended with blood stained serum The purulent exudate over the hemispheres suggested that the illness had lasted a week In another case at Plymouth lumbar puncture on the third day of the disease gave exit to 30 c c of turbid fluid and 15 c c of Gordon's multivalent serum were injected intrathecally, five hours later respiration stopped before the pulse The necropsy showed fibrino purulent exudate over the base of the brain and much yellowish fibrin over the pons and medulla turbid and blood stained fluid in both ventricles oedema of the cerebellum pressing on the pons dilatation of the right side of the heart and recent and old endocarditis of the mitral valve Although death did not occur until five hours after the injection of serum this case resembles the first in the presence of blood stained fluid in the lateral ventricles of the brain In a third case death occurred suddenly seven hours after injection of serum and the necropsy showed distension of the lateral ventricles and acute congestion and oedema of the cerebellum pressing on the pons

In a man who had had six lumbar punctures the site of the punctures became inflamed and death rapidly followed; at the necropsy it was found that the lateral ventricles were greatly distended with pus swarming with streptococci

In two cases lumbar puncture gave rise repeatedly to severe headache which was partially relieved when serum was rejected intrathecally

(4) History of the Outbreaks of Cerebrospinal Fever at Various Centres

The Portsmouth District

The 28 cases treated at the Royal Naval Hospital Haslar, were drawn from the Royal Naval Barracks Portsmouth (14 cases) the Royal Marine Artillery Barracks Eastney (4 cases) the Royal Marine

Light Infantry Barracks, Forton (3 cases), H M S Excellent (9 cases) H M S Fisgard (2 cases) and isolated cases from H M S "Amphitrite, H M S "Vernon and from a torpedo boat Three of the 28 cases arose in the Zymotic Block at Haslar while under treatment for measles

In the Portsmouth district the monthly incidence of cases in the Royal Navy was as follows August 3 September 3 October 2 January, 3; February 5 March 9 April 2 and May 1 As in the first year of the War the largest number of cases occurred in March

The early cases were treated by Mullord's serum (5 recoveries 4 deaths) then 6 cases were given the Pasteur Institute multivalent serum or Gordon's serum (4 recoveries 2 deaths) and in the later part of the year Flexner's serum alone was given (with 9 recoveries 1 death) Three cases were not given serum (2 recoveries 1 death) Staff Surgeon Adshead found that lumbar punctures could be performed without discomfort or struggling under the influence of a hypodermic injection of scopolamine $\frac{1}{70}$ gr morphine $\frac{1}{4}$ gr and atropine $\frac{1}{150}$ gr in 5 minims of water given half an hour previously

Of the 28 cases 8 or 28·5 per cent died and 20 recovered this compares favourably with a mortality of 19, or 52·7 per cent out of the 36 cases treated at Haslar in the previous year

Dr P Fildes found that out of 603 contacts there were 25 or 4·1 per cent carriers that out of 3 023 new entries swabbed there were no positive carriers and that swabs from 16 cases of the disease were in every instance negative

The Royal Naval Barracks, Portsmouth.—Out of the 14 cases four occurred between August 28 and September 8 1915 On August 28 29 31 cases occurred in three boys who were in contact with a boy who had the disease in April 1915 and was found in September to be an obstinate carrier An isolated case occurred on September 8, and then there were no cases until February 10, 11, 16 and 24 On March 4 a case arose in Haslar Camp in a man who left the barracks on February 28 other cases occurred on March 5 6, 13 14 and 27 and the last case occurred on April 23 The total number of cases is practically the same as in the previous year (16)

The Royal Marine Artillery Barracks Eastney.—The first of the four cases (one fatal) from this depot occurred on February 16 and was so atypical that it was not until March 7 that lumbar puncture was performed and proved that the cerebrospinal fluid which was clear contained meningococci It is perhaps worthy of note that about the same date a similarly atypical case which was not bacteriologically proved until three weeks after admission arose in the Royal Naval Barracks, Portsmouth and that both cases recovered without the use of serum A fulminating case, fatal within thirty six hours occurred on March 8 followed by unconnected and non fatal cases on March 10 and 16 In the first year of the War there were 13 cases with 6 deaths

The Royal Marine Light Infantry Barracks Forton.—Of the three cases borne on the books of these barracks one only arose in the barracks A boy aged 17 went sick on May 5 in a room with an individual space of 600 cubic feet the origin of the infection could not be traced Of the other two cases one was remarkable as presenting a relapse after a long interval a private went sick with the disease on

January 13, at Alexandria where he was proved bacteriologically to have the disease and according to his own statement was tapped nine times. After February 1 the temperature was normal, and on March 20 he was admitted convalescent to Haslar. On March 23 the temperature rose to 101·1° F. He had a violent headache, Kernig's sign, and lumbar puncture yielded 30 c.c. of turbid fluid under great pressure containing meningococci. He received 20 c.c. of Flexner's (1915) serum, and within a few hours had an immediate serum rash. The temperature was normal on March 24 and he made a good recovery. The other case was in a private who left his ship for his home in Gosport five days before he went sick. He never went into Forton Barracks and he might have contracted the disease on the journey from the Grand Fleet.

During the previous year four cases, none of which originated in the Barracks, were reported from this depot.

The Plymouth District.

Twenty-eight cases were reported from this depot as compared with 48 in the first year of the War. Twenty-seven were treated in the Royal Naval Hospital, Plymouth; the remaining case was that of a man who joined the Royal Naval Barracks on March 2, 1916, went on leave two days later, died on March 7 in London and was found at the necropsy to have cerebrospinal fever. The 28 cases were drawn from the Impregnable Establishment (13 cases), the "Powerful" Establishment (7 cases), the Royal Naval Barracks (4 cases), H.M.S. "Cambrian" (2 cases), and H.M.S. "Indus" (2 cases).

In the Plymouth district the monthly incidence of cerebrospinal fever in the Royal Navy was: November 2, December, 4, January 2, February 10, March 4, June 1, and July 1. As in the first year of the War the largest number of cases occurred in February.

In the majority of the cases lumbar puncture was performed under general anæsthetic by Staff Surgeon D. H. C. Given. The first 7 cases, from November 12, 1915, to January 10, 1916, were treated with the Haslar Institute serum (3 deaths); after this Pasteur Institute multivalent serum, Gordon's multivalent serum or Flexner's multivalent serum were used for clinical alone, sometimes in combination. Out of 5 cases treated solely with Flexner's serum 1 only proved fatal, and in this instance there was a secondary streptococcic infection of the nervous system through the lumbar puncture wound. Of 5 cases treated with the Pasteur Institute's multivalent serum 1 only died; of 4 cases treated with Gordon's multivalent serum 1 proved fatal; of 3 cases treated with both Flexner's and the Pasteur Institute's serums 1 died; and of 2 treated with Flexner and Gordon's serums 1 died. Of these 27 cases 19, or 70 per cent. recovered and 8, or 30 per cent., proved fatal. This is better than the 36·7 per cent. mortality in the previous year which was remarkably low for that epidemic. The mortality appeared to be determined by the age of the patients rather than by their treatment; for out of 20 boys from the "Impregnable" (13) and "Powerful" (7) Establishments none of whom were more than 16 years of age 2 or 10 per cent. only died, whereas one of 7 men from the Royal Naval Barracks, H.M.S. "Cambrian" and "Indus" 6 or 85·7 per cent., died, the man who recovered was 26 years of age.

Fleet Surgeon H. C. Whiteside found that out of 2,049 contacts of

cerebrospinal fever cases 195 or 9·5 per cent. were [illegible] out of 2,813 new entries 52 or 1·84 per cent. [illegible]. This investigation referring to the first half of 1916 [illegible] ject of a report by Fleet Surgeon H. C. Whiteside.

In *the Impregnable Establishment* the first [illegible] on October 12 in Impregnable I. and proved fatal. Cases then occurred in Impregnable III. on November 2 [illegible] 2 (fatal), 4 and 8, the last two being from the same mess. On December 14 a case occurred in Impregnable IV. (late "Cumberland") who had communication with Impregnable III. After an interval of seven weeks 3 cases occurred in Impregnable I. on February 4 and 12 (a case). On February 23 a case appeared in [illegible] Impregnable III. After this isolated cases arose in Impregnable III. on April 31 and in Impregnable I. on June 8 and July 23. The last case was of rather special interest as the cerebrospinal fluid contained pneumococci as well as meningococci. There was a hæmorrhagic rash, herpes of the nasal branch of the ophthalmic division of the fifth nerve, no evidence of pneumonia and recovery. The number of cases (13) is larger than during the first year of the War (9) although, from figures kindly provided by Fleet Surgeon L. E. Durnell, the individual cubic space is now greater than it was a year ago.

The Powerful Establishment which had 2 cases in 1914 and 2 cases in the first year of the War both on April 10, 1915 in Powerful I., had 7 cases between February 1 and April 29, 1916. Six cases occurred in Powerful I. on February 1, 18, 19, March 29, April 2 and 29. One case arose in Powerful II. on February 4. The increased incidence of cerebrospinal fever in Powerful I. is due to some undetected factor, for the hygienic conditions have improved since the first year of the War. The upper parts of the doors in the casemates which are used for classes have been perforated, thereby increasing the ventilation. The upper deck was roofed over and boys slept there since January 21, 1916, in this way 100 additional cubic feet per boy was obtained, and the incidence of catarrhal fevers forthwith diminished. Nevertheless cerebrospinal fever began on February 1.

The Royal Naval Barracks, Devonport.—A fulminating case occurred on March 29, 1915, followed on March 30 by a case which recovered and on April 2 by a case which proved fatal with a secondary strepto coccic infection from the lumbar puncture (*infra* p. 12). None of these cases had been in contact with cerebrospinal fever patients or with previously recognized carriers. As mentioned above a man attached to this depot died in London of cerebrospinal fever but was in the barracks for two days only. In the first year of the War there were fifteen cases in this depot.

In the "Cambrian" two cases occurred among the stokers on January 10 (a fulminating case) and 30. No cases occurred here during the first year of the War.

In the "Indus" two cases occurred among the engine room artificers on February 7 and 29. During the first year of the War there were two cases here.

At the Marine Light Infantry Barracks, Devonport no cases occurred. In the first year of the War there were three cases.

Chatham District

The 18 cases reported were drawn from the Royal Naval Barracks (14) the Royal Marine Light Infantry Barracks (2) and H M S Egmont (2) and were treated at the Royal Naval Hospital, Chatham

The monthly incidence of cases in the Royal Navy in the Chatham District was as follows November, 1 December, 3 February, 6 March 6 April, 1 May 1 In the previous year the largest number of cases occurred in February During March 1916, there was an outbreak of the disease among the soldiers in the district

The treatment of the cases was described by Temporary Surgeon W H W Cheyne who insisted on the importance of early and frequent injection of mixed serums and of anæsthesia for lumbar puncture and the administration of serum

Of the 18 cases 9 or 50 per cent, proved fatal this is an improvement on the mortality of 16, or 76 per cent out of the 21 cases during the first year of the War but it is much above the percentage mortality (35 6) for the whole 104 cases in the Royal Navy during the second year of the War In this connection the following points should be taken into consideration Five of the fatal cases were complicated with otitis (1 with a large perforation of the tegmentum tympani into the cranial cavity, the other with thrombosis of the cavernous sinus), which appeared to be the lethal lesion and 3 other fatal cases had one dose only of the Lister Institute serum Of the remaining 13 cases treated with serums 4 (1 with delirium tremens) or 31 per cent proved fatal Of the 9 recoveries, 4 were troubled (2 having lost an eye)

Staff Surgeon S T Dudley found that out of 2 548 new entries (March to July, 1916, inclusive) swabbed 58 or 2 23 per cent., were positive carriers

Royal Naval Barracks.—The first case occurred on November 28 in a boy servant who had already been fourteen days in a medical ward of the Royal Naval Hospital for right sided pleurisy The second case, in a second class stoker returned from leave with symptoms of two days duration on December 4 The third case in a seaman aged 37 one of otitis with thrombosis of the cavernous sinus went sick on December 5, and was bacteriologically proved to be meningococcic at the necropsy only No further case occurred until February 6 when a seaman aged 28 had a sharp attack of the disease from which he recovered It is interesting to note that in July 1915 he had high fever and meningitic symptoms in the Royal Naval Hospital Plymouth where lumbar puncture was done and normal cerebrospinal fluid withdrawn He had a strongly positive Wassermann reaction and recovered under anti syphilitic treatment On February 17 an officer's steward third class who had been in the service nineteen days went sick On February 22 a second class stoker developed the disease and on February 23 a cook's mate went sick A close contact of the case on February 22 showed signs of the disease on February 27 Then there was an interval until March 13, when 3 cases occurred among second class stokers followed on March 23 by a seaman's R N R On March 30 another second class stoker went sick with the symptoms of the disease and died when on leave but as bacteriological examination was not available, he is not included as a case A fulminating case in an officer's steward third class occurred on

[illegible] M. P. [illegible] were [illegible]

[illegible] cases [illegible]

[illegible] on December [illegible] and [illegible]

[illegible]

At this depot between [illegible] cases with a mortality [illegible] and [illegible] deaths (63·6 per [illegible] War [illegible] the incidence in the [illegible] the [illegible] again [illegible] at Crowden [illegible] fever [illegible] health [illegible] information [illegible]

[illegible] on December [illegible] prevalent [illegible] fever [illegible] cases occurred [illegible] there were [illegible] 2nd [illegible] June [illegible] These cases [illegible] [illegible] [illegible] [illegible] [illegible]

Fleet Surgeon P. W. [illegible] 3 or 6·12 per cent. positive carriers [illegible] entries and [illegible] pleted their [illegible] examined [illegible] 1916, 45 carriers, 37 of which [illegible] in March [illegible] April [illegible]

[illegible]

There were [illegible] with [illegible] death [illegible] between November [illegible] and July 29 [illegible] with 7 cases (5 fatal) in the [illegible] the War. [illegible] on probation [illegible] (from H.M.S. [illegible] recovered.

The first case occurred on November [illegible] had been in hospital with [illegible] for twelve days and was convalescent when [illegible] arose and lumbar puncture showed that [illegible] On November 19 there was a second case [illegible] until February [illegible] 1916 when [illegible] of cerebrospinal fever. Seven weeks later [illegible] case in a boy who rapidly recovered [illegible] May [illegible] Cases also occurred on May 8, 22, and [illegible] interval there was a sudden outbreak [illegible] of cerebrospinal fever in July. Of [illegible] cases [illegible] to be due to meningococcic infection. [illegible] occurred on July 10 in a boy who had been in the [illegible] had been vaccinated six days before the onset of [illegible] proved case of cerebrospinal fever occurred [illegible] dormitory (No. 7) which had an individual [illegible] patient had joined two and a half weeks [illegible] a week before the onset. Two other cases [illegible] positive occurred in the same dormitory on July [illegible] case of cerebrospinal fever arose on July 21 in a [illegible] this boy had

B

joined the Service the day be[illegible] vaccinated A fourth case occurred on July 29

Of the 11 cases not proved bacteriologically to be meningococcic the records of the cytological examination of the cerebrospinal fluid are available in 9 cases In 2 there was an excess of lymphocytes over polymorphonuclears neither of these cases showed any subsequent paralysis, and so cannot be regarded as examples of the meningitic form of acute poliomyelitis further as there was one case only of mumps during July at Shotley, it is improbable that the meningitis was a complication of that disease In 1 case the lymphocytes and polymorphonuclears in the cerebrospinal fluid were present in about equal numbers In 2 cases the polymorphonuclears were in excess of the lymphocytes in one of these cases there was transient and slight weakness of one leg Four other cases had persistent headache 2 showing mental disablement One case the cytological report of the cerebrospinal fluid of which is not known was left with weakness of the right leg, loss of the knee jerk on that side, tenderness of the posterior tibial nerve, and weakness of control of the bladder This appears to be the only one of the 11 cases which could be regarded as an example of the mem gitic form of acute polio myelitis Dr G I P Stewart Medical Officer of Health for East Suffolk has kindly informed me that no contemporaneous outbreak of acute polio myelitis or of cases of a similar doubtful nature was reported in the county

Ten cases were treated by intrathecal injection of Gordon's multivalent serum after washing out the spinal cord with 0 5 per cent of carbolic acid in saline solution as suggested by Captain Sheffield Neave, R A M C (T) of Ipswich This method of treatment appeared to be beneficial and certainly no bad effects were ascribed to it

Deaf.

At the Marine Depot 3 cases occurred on January 31 and February 1, both of which recovered In the first year of the War 26 cases (with 8 deaths) originated at this depot

Cases in Sea going Ships

Ten cases were reported from sea going ships but in no instance did more than 1 case arise in the same vessel a most satisfactory result The cases occurred in the "Campania (August 6 1915), "Torpedo Boat No 110 (September 9) a mine sweeper 56 Elvira' (September 28), 'Shannon (October 13), 'Dolance (November 5) Bristol (May 3 1916), "Conqueror (May 5) 'Royal Oak (May 33), Lydiard (July 9) and 'Malaya (July 27) There were 5 deaths The average age of all the cases was 23 7 years of the fatal cases 25 2 and of the recoveries 22 2 years The high mortality is perhaps explained by the delay that may necessarily occur in obtaining serum treatment In the first year of the War there were 12 cases with 8 deaths so only one ship was there more than one case. Thus during the first two years of the War out of 274 cases of cerebrospinal fever 23, or 8 per cent cases with 13 deaths or a percentage of 59, occurred in sea going ships

In addition to the medical officers incidentally mentioned I beg to express my sincere thanks for courteous help and information to Deputy Surgeons General H W G, Doyne and R. Hill, C V O Inspector Surgeons W H S Stallard F Fedarb M Rodd T D Halahan, J A Campbell C J E Cook W L Martin E A Shaw Staff Surgeon L Warren, and Temporary Surgeons W H Watson Cheyne, and E J Tongue.

THE EFFECT OF [illegible] ON THE AGGLUTINATION REACTION IN THE TYPHOID FEVER AND THE DIAGNOSIS OF THIS DISEASE IN INOCULATED PERSONS.

By [illegible], Surgeon [illegible], R.N.
R.N. Hospital, [illegible]

The following communication deals with the results of agglutination tests performed at the Royal Naval Hospital, Haslar, on about 1,000 inoculated men from the Gallipoli region.

The men had all been invalided home having suffered or, in some cases, still suffering from either typhoid, paratyphoid or dysentery or, as was often the case, from intestinal symptoms which could not be attributed to any of these diseases, and were therefore distinguished by the non committal term "enteritis."

The patients were for the most part, convalescent on arrival. They were all, however, subjected to a routine bacteriological examination, one of the chief objects of which was to estimate the incidence of typhoid fever amongst those invalided home and form some opinion upon the value of antityphoid inoculation.

Part of the examination therefore consisted in testing the agglutination reactions of the patient's serum on the organisms of the typhoid and dysentery groups.

These reactions were in the majority of cases the only grounds on which to base a diagnosis and, when typhoid was in question, this diagnosis was complicated by the fact that over 90 per cent. of the men had received antityphoid inoculations.

Owing to the pressure of work, and to the fact that the patient's stay in hospital was usually a short one, it was impossible in most cases to test the blood on more than one occasion. No conclusions based upon variations in the titre of the serum were therefore possible.

When the results of somewhat over a thousand Widal reactions were available, it was decided to try to estimate the significance of the various degrees of agglutinating power met with in the inoculated individuals. The series under analysis then, consisted of inoculated men, some giving a negative Widal reaction and others giving various degrees of positive reaction: the effect either of the inoculation or of typhoid infection or possibly in a few cases the result of both these factors.

At first sight [illegible] impossible to draw any conclusions from [illegible] which in some of the cases the reactions were the result of inoculation while in others, they were produced by [illegible]. As will be shown later, however, advantage [illegible] that the strength of the reaction, in those showing [illegible] effects only, will decrease as the time since inoculation [illegible]. This relation to the time of inoculation will not [illegible] in which the reaction is due to subsequent typhoid [illegible].

TECHNIQUE

The majority of the tests were performed by the same observer, Fleet Surgeon [illegible] Shaw. The standard emulsions of Dreyer were used exclusively, that of *Bacillus typhosus* being of almost uniform agglutinability throughout the series. The macroscopic method in small test tubes heated to 55° C. for two hours was adopted, the serum [illegible] being tested in dilutions of 1 in 25, 1 in 50, 1 in 100, and 1 in 250.

TABULATION OF RESULTS OF AGGLUTINATION TESTS

By dividing the [illegible] into groups according to these various strengths of reaction it was possible to say that certain groups were composed chiefly of individuals exhibiting inoculation effects only, while in [illegible] another group the agglutination reactions were in the majority of cases due to typhoid infection.

The date of inoculation being recorded in each case, the first step was to arrange the results in a table as follows:—

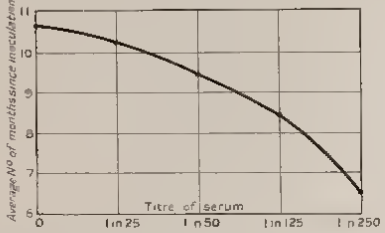
[illegible] THE NUMBER OF CASES WHICH GAVE AGGLUTINATION REACTIONS IN [illegible] AT [illegible] MONTHS AFTER INOCULATION

[illegible]	Months since Inoculation									
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17	18
[illegible]	[illegible]	8	33	28	23	25	21	6	2	1
[illegible]	[illegible]	[illegible]	7	10	11	1	13	0	0	0
[illegible]	[illegible]	[illegible]	22	15	19	1	6	4	1	0
[illegible]	[illegible]	11	11	3	3	2	3	3	0	0
[illegible]	[illegible]	1	8	3	10	10	1	1	1	0

The cases [illegible] divided into five groups: (1) Those giving no agglutination in a dilution of 1 in 25; (2) positive in 1 in 25; (3)

positive in 1 in 50 (4) positive in 1 in 125, (5) positive in 1 in 250 and over. This table supplies the data from which subsequent deductions are made.

If a number of persons have been inoculated against typhoid and have not subsequently contracted the disease those recently inoculated will show, on the average, a greater degree of agglutinating power than those inoculated at a more distant date. Conversely the cases being arranged in groups according to the titre of the serum, the average time since inoculation for each group will diminish as the titre increases, e.g. those giving a reaction in 1 in 250 will show on the average a shorter "post-inoculation" time than those which give a positive only in 1 in 125. This may be represented graphically thus:—



The first step in this investigation therefore was to find the average time since inoculation for each group of the series (grouped according to strength of titre) and observe to what extent the results agreed with the above.

The average time for each group was obtained from the original table thus: Multiply the number under each month by the number of the month, add the series of numbers so obtained for each group together and divide this total by the total number of cases in the group. The average time since inoculation for the whole series was estimated in a similar manner.

The following results were obtained —

Titre of serum	Average number of months since inoculation
Negative	8·06
Positive 1 in 25	8·66
1 in 50	8·32
1 in 125	7·95
1 in 250	9·0
Average time for whole series	8·04

These results are expressed graphically thus (Chart A) —

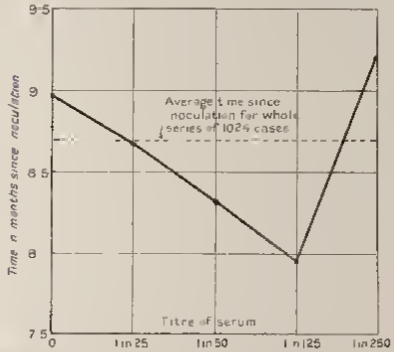


Chart A showing average number of months since inoculation for each group of cases. Left groups (1) Negative (2) 1 in 25 (3) 1 in 50 (4) 1 in 125 (5) 1 in 250

It will be seen from this chart that the first four groups i.e. Negative, 1 in 25, 1 in 50 and 1 in 125 correspond with the previous chart and follow a steadily diminishing post-inoculation period as the titres become higher. The last group 1 in 250 on the other hand, shows a striking deviation from this downward line giving an average post inoculation time greater than that exhibited by the negative group. Obviously, therefore the cases in this 1 in 250 group have been influenced by some other factor than inoculation

[illegible] To [illegible] were tested and [illegible] charted [illegible] above the numbers being small they [illegible] up (1) Negatives (2) positives in [illegible] from 1 in [illegible] 1 in 125 (3) positives in 1 in 250 or [illegible] These are charted with the previous series, which is also [illegible] three similar groups

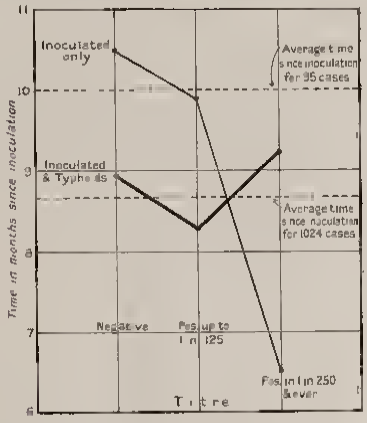


CHART B.—Comparing two series (1) Mixed series in some of which the reactions are due to typhoid (2) those in which the reactions are due to inoculation alone

It will be observed that the first parts of both curves are similar the negative groups showing a post-inoculation time above the average, while in the second groups comprising those positive in dilutions of 1 in 125 and less it is below the average—the average

time from [illegible] in each case indicated on the chart by a dot

Considering [illegible] cases of 1021 cases therefore, the [illegible] positive in 1 in 121 or less agrees with [illegible] we would expect of a collection of cases showing reaction due to inoculation They also behave in the same way as a series which we know is made up of those exhibiting inoculation effects only We can, therefore say that these groups giving positives in dilutions of 1 in 121 or less contain very few cases of typhoid the reaction being almost entirely due to antityphoid inoculation

When we come to the last group in the two series under consideration which comprises those positive in 1 in 250 and over the control cases shew a post-inoculation time considerably below that of the previous groups while our original series shews a time well above the average and indeed above that of the negative group We may therefore safely say that this group giving a positive in 1 in 250 or more is composed mainly of those in whom the agglutination reaction is the result of typhoid infection the longer post inoculation period indicating that this infection occurred chiefly in those cases in which the protective effect of the typhoid vaccine was wearing off with the lapse of time

It has now been shown that inoculation is responsible for the vast majority of positive reactions in dilutions of 1 in 125 or less, while positives in dilution of 1 in 250 or more are as a rule the result of typhoid infection

We shall now consider in more detail the various groups of cases giving different degrees of reaction

The arrangement of results for this purpose is different from that just used the data, however are obtained as before from the table given in the beginning of the article. The cases are divided into three classes according to the time since inoculation (1) Those inoculated within six months of examination, (2) between six and twelve months (3) between twelve and eighteen months In each of these periods of six months the number of cases showing the various strengths of titre is recorded and these numbers are expressed as percentages

The figures thus given represent the percentage of cases for each titre in each of these three periods of six months If these are expressed graphically we get the following chart The manner in which the percentage of cases giving any one titre varies, according to the time since inoculation, can be seen in this chart at a glance

[illegible] into [illegible] Various Degrees of [illegible]

[illegible]	[illegible]	[illegible]	Number [illegible]	Per cent	[illegible]	[illegible]
				Months since Inoculation		
[illegible]	[illegible]	[illegible]	167	18 1	1	[illegible]
[illegible]	[illegible]	[illegible]	2	15 1	31?	[illegible]
[illegible]	[illegible]	[illegible]	11	14 5	40	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	17 5	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	11 7	3	[illegible]
[illegible]	[illegible]	100 [illegible]	161	100 0	[illegible]	[illegible]

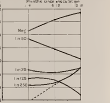


Fig. 1. Showing the various percentages giving different titres after each of the six monthly periods since inoculation.

Taking the groups in order therefore —

(1) *Negatives.* — The percentage of inoculated individuals giving a negative result in 1 in 25 dilution within six months of inoculation is fairly high, being 31.5 per cent. The percentage of th[illegible]

negative cases increases steadily as the "post inoculation" time becomes longer, reaching 38·5 per cent for the cases inoculated twelve to eighteen months previously. The comparatively small difference in the number of negatives yielded by those examined within six months of inoculation, and those twelve months or more after probably depends on two factors —

(*a*) Most of the cases which give a negative in 1 in 25 fall to this level early in the first six months. This is to be expected from the usual form of the agglutination curve showing an early steep descent which in these cases brings the titre to below 1 in 25. Thus —

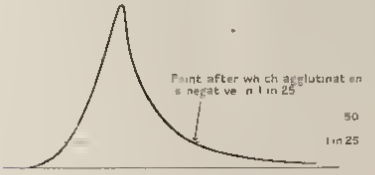


Diagram of agglutination curve.

(*b*) The percentage is calculated on a mixed collection of cases, and the proportion showing reactions due to typhoid infection occurs chiefly in the twelve to eighteen month period. A good many of these infected cases probably gave a low titre of agglutination before contracting typhoid and would have fallen into the negative group, which is thus to some extent reduced by their removal.

The next group comprising those giving a positive in 1 in 25 dilution is a small one. The curve produced takes on the whole a nearly horizontal course, showing a slight downward slope at first and rising again in the twelve to eighteen month period. This rise is probably accounted for by the fact that many of the next group (1 in 50) having fallen below this titre after twelve months then take up a position in the 1 in 25 group.

The third group 1 in 50 contains, after the negative group, the largest number of cases (265). The curve shows a steady fall from 28·2 per cent in the most recent six months to 20·8 per cent in

the twelve to eighteen month period. The titre of 1 in 50 seems the commonest which persists for any considerable time after inoculation.

The fourth group giving a titre of 1 in 25 shows a similar fall to that exhibited in the third, dropping from 13·2 per cent. in the most recent period to 6·3 per cent. in the twelve to eighteen month group. The figures, however, do not plot a straight line, there being a sharp drop in the twelve to eighteen month period. The comparatively small number of cases (twelve in the 'twelve to eighteen month' group) may lead to some mathematical error in this case, but on the other hand it is quite probable that there is a considerable fall after twelve months in the percentage of cases giving a titre of 1 in 125.

The last group giving a titre of 1 in 250 or more, as shown previously, is undoubtedly composed chiefly of cases in which the reaction is due to typhoid infection. It shows, instead of a fall in the percentage as the time since inoculation increases, a marked rise, occurring especially in the cases in which twelve to eighteen months have elapsed since inoculation. This represents the higher incidence of typhoid in those cases in which there has been a lapse of more than a year since inoculation. The comparatively high percentage in the one to six month group period would be accounted for by the inclusion of cases showing agglutination in 1 in 250 due to the recent inoculation. Were these cases excluded the curve would show a much steeper drop in the recent period, resembling the dotted line in the chart.

Conclusions.

(a) The Persistence of the Agglutination reaction after Anti-typhoid Inoculation.—(1) In about a third of all inoculated persons the titre of the serum fell to below 1 in 25 in the first six months after inoculation and probably in most of these, early in this period.

(2) In the majority of those giving a persistent positive after inoculation the titre was 1 in 50 or less, of those inoculated twelve to eighteen months previously 17·2 per cent., giving agglutination in 1 in 25 and 20·8 per cent. in 1 in 50. A smaller proportion of cases, about 13 per cent. gave an agglutination in 1 in 125 which persisted for more than six months, but in the majority of cases, dropped below this after a year.

(3) Those showing a titre of 1 in 250 and over represent two

classes (*a*) Those in which the reaction is due to typhoid infection and (*b*) those in which it is due to inoculation In inoculated persons showing agglutination of 1 in 250 and over due to inoculation this title was rarely maintained for more than six months In those cases in which the period since inoculation was more than six months a title of 1 in 250 was the result, in the vast majority of cases of typhoid infection

(*b*) *The Diagnosis of Typhoid in Inoculated Persons*—The figures given in this paper represent the average for a large number of cases by far the greater proportion falling within the limits described No account is taken of individual peculiarities Hence although we may not be able to diagnose typhoid or the absence of typhoid in any particular inoculated person, diagnoses made on these lines will give a true picture of the incidence of typhoid in a large series of cases

The practical application of these results to the diagnosis of typhoid has been as follows —

(1) In general the serum must give a positive reaction in a dilution of at least 1 in 250 before it is possible to diagnose typhoid fever in inoculated persons on an agglutination test alone

(2) Even a positive in this dilution in a recently inoculated person (within six months) is not, as a rule the result of typhoid infection but of the inoculation In practice it was necessary to have some definite rules for diagnosing these doubtful cases of recently inoculated patients and the following were adopted —

In those cases which had been inoculated twice typhoid was diagnosed if the serum gave a positive in a dilution of 1 in 250 five months or more after inoculation In those inoculated once a similar title four months or more after inoculation was considered probably typhoid infection The reasons for the adoption of this rule were as follows Although we know that a titre of 1 in 250 within six months of inoculation is in a considerable number of cases due to this inoculation the number of cases in the series was not sufficiently large to be able further to analyse this group of recently inoculated cases. We do not know therefore for certain whether these cases showing inoculation effects only are distributed more or less evenly over the whole six month period, or are found chiefly in the latter half—i e , in those inoculated within three months or so—as would be expected In order to meet this last possibility as far as possible, and not to exclude any cases that might reasonably be considered as typhoid the above rule was adopted

cases showing an agglutination in 1 in [illegible] since inoculation would contain a consid[illegible] and in practice it was assumed that [illegible] from typhoid

Working on the above scheme the [illegible] in the series of 1 024 cases was about [illegible]

A series of 115 cases of unmounted [illegible] the same time as the above series and [illegible] agglutination tests thirty two cases [illegible] giving a percentage of 27 6

We can therefore say that of those [illegible] with intestinal disease not more than [illegible] lated had had typhoid while at least 27 [illegible] lated from the same source had contracted [illegible]

THE INCIDENCE OF TYPHOID FEVER AND THE RESULTS OF ANTI-TYPHOID INOCULATION DURING THE SECOND YEAR OF THE WAR OCTOBER 1915 TO OCTOBER, 1916

By Fleet Surgeon P W Bassett Smith C B M R C P I R C S R N

In the January (1916) number of this Journal, the results which could be gathered from the inoculation returns of 1914-1915 were set forth and the technique employed was described The same methods have been used this year, but the necessity of rest after inoculation has been emphasized and generally enforced

In the autumn of 1915 simple typhoid vaccine was used to a large extent, as shown in the table below, but during the present year a triple vaccine *Bacillus typhosus B paratyphosus* A, and *B paratyphosus* B has always been used for those proceeding to the Eastern Mediterranean, Persian Gulf, Russia, France and Belgium The typhoid culture selected was one isolated from a Gallipoli case This was lethal to a guinea pig and gave good agglutination reactions and is known as *B typhosus* (G) The paratyphoid cultures five strains each of "A and "B were the same as those referred to in the last report

The composition of the triple vaccine prepared at Greenwich is —

B typhosus	500 millions per c c
B paratyphosus A	250 "
B paratyphosus B	250 "

For the first inoculation 1 c c is given, and for the second, 2 c c A triple vaccine is also prepared at the Royal Naval Hospital, Malta containing similar proportions of *B paratyphosus* A and B

Abstract of Returns which have been received

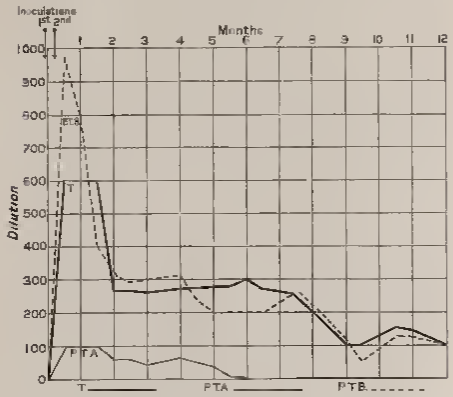
	Typhoid	Paratyphoid	Twice
Number of men inoculated	12 658	1 523	11 116
Triple typhoid			
Number of men inoculated	8 011	439	7 590
Number inoculated twice against typhoid			18 695

Comparatively few severe reactions or sequelæ were reported these rarely occur if proper precautions are taken It has been noted by some officers that the first inoculation produces much more severe effects than the second but this was certainly not universal One case was invalided from Haslar for epilepsy twelve days after the first inoculation and another was invalided subse-

quently [illegible] With [illegible] of 39 8/5 [illegible] there [illegible] a cord of [illegible] reaction at the [illegible] injection which speaks well for the care taken over the [illegible] operation

The annexed curves show the immunity reactions over a period of one year given by a laboratory attendant inoculated with two doses of the triple vaccine The response to typhoid and para typhoid B has been good and lasting that to paratyphoid A very feeble

Agglutination Curve after use of Triple Typhoid Vaccine



Cases of Enteric Fever during the Year

In this period there were 295 cases definitely recognized as typhoid fever Of these forty five occurred among men of the general Naval Service who had not been inoculated Seven of these cases were in a small epidemic at St Vincent these forty five have not been included in the tables

The remainder were from the Mediterranean and western war

areas among those on whom inoculation had been carried out to a large extent. This statistical return is the result of an investigation of cases clinically diagnosed as enteric using this term in its widest sense.

The most detailed and valuable evidence is contained in a report by Fleet Surgeon Dudding from Royal Naval Hospital Haslar in which 1,000 cases are tabulated. (See Report by Dr. Fildes this Journal vol. II, No. 3, pp. 311-312.)

R.N. Hospital Haslar.

Total cases—1,000.

		Type I		Para A		Para B	
		Cases	Deaths	Cases	Deaths	Cases	Deaths
Uninoculated	197	31	24·4	19	10·2	11	11
Inoculated 1 dose	61	9	14	1	7·8		
Inoculated 2 doses	802	82	10·1	60	7·1	99	11
		122		80		108	

Data from Plymouth, Chatham, Portland and Malta records of 1,165 enteric cases were received, giving the following results:

		Para I		Para A		Para B	
		Cases	Deaths	Cases	Deaths	Cases	Deaths
Uninoculated	199	71	35·6	31	16·5	21	10·5
Inoculated 1 dose	38	8	25·5	1	15·7	5	11·1
Inoculated 2 doses	413	49	11·6	131	31·2	95	2·0
		128		163		120	

Mixed infections were occasionally present. In the second group of cases the percentage of paratyphoid among the inoculated was high as very few cases except typhoid and paratyphoid were included in the returns. A great many of these occurred in the autumn of 1915 and the men had probably not received any protection by vaccine against these fevers.

Judging by the high intoxication curve given above, the immunity resulting from the paratyphoid A vaccine is only slight and short lived, indicating the desirability of making the vaccine still more polyvalent.

The reduction in the incidence of typhoid is marked in both groups. The percentages given above are only those found in cases suffering from intestinal fever attacks, but if the total number of men twice inoculated is considered the results for typhoid show 18,000 men with 131 cases or 0·7 per cent.

THE SHATT EL ARAB RIVER WITH SPECIAL REFERENCE TO MALARIA

By Surgeon Q H Richardson, R N

The Shatt-el-Arab extends from Gurna where it is formed by the junction of the Tigris and Euphrates to the Persian Gulf a distance of some 120 miles

The word 'shatt' means "fresh-water river," and though tidal throughout, the Shatt-el-Arab is fresh water from its source to Fao a small village and telegraph station nearly at its mouth

The width is variable mostly from a half to a quarter of a mile though in places less, whilst the banks are extremely low lying—seldom more than a few feet above high-water level

At intervals along the mud flats and shallow water of the fore shore, curious structures are seen made of reeds closely set upright in the mud, in somewhat the form of a query mark, the arm of which commences at the river bank whilst the loop extends downwards into the water These are fish traps and at low tide when the whole contrivance is out of water any fish which entered but failed to leave the loop before the receding tide uncovered the opening, are picked up

Behind the river banks the land stretches away as a flat plain though here and there isolated mounds and areas of slightly higher lying land occur which are usually selected by the natives to build their mud or reed huts upon, and thus render their dwellings immune from the annual floods which take place Those who do not observe this precaution often find their abodes inundated, though apparently this is not regarded at all seriously as in this case the family canoe or bellum is simply floated into the hut, and the native continues a placid existence therein surrounded by his wives, children, and livestock

The flood season, which is said to depend more on the snow melting in the Caucasus and on conditions affecting the tributaries at a distance than on local rain, lasts from April to July To guard against this, mud banks or bunds are constructed along the lower lying portions of the river banks reinforced very often by the trunks of old date trees. These bunds are frequently inadequate with the result that it is not unusual for large areas of land to be completely submerged To gain some idea of the extreme flatness of the country, it is only necessary to recall the fact that Bagdad

[illegible]

[illegible] along the river banks [illegible] on the [illegible] depends solely on irrigation which is effected by numerous shallow irrigation channels, constructed at right angles to the main river, and which are joined inland by systems of cross channels. These are filled and emptied by the tide with the result that those trees nearest the river receive a far more constant supply of water than those further inland and flourish accordingly. The present width of the date belt varies from a few hundred yards to half a mile or more which is the maximum distance under the present conditions, that the water will flow up the irrigation channels before the tide turns.

Above Busreh the belt loses its complete continuity, and one finds intervening areas of bare desert stretching away to the horizon. In the neighbourhood of Gurna one of the supposed sites of Eden enormous areas of land are, during the flood season completely inundated each year, and often no attempt is made at bunding. Here reeds grow luxuriantly to a height of ten or more feet the river course being alone distinguishable as an area free from their growth.

During the winter in the Shatt-el-Arab duck and snipe are plentiful and good shooting is easily obtainable, whilst in the summer fair sport can be had with rod and fly. Bathing is unfortunately unsafe owing to the presence of sharks, which enter the river in the hot months and are said to run up as far as Bagdad.

The date belt, which might be termed the inhabited area proper, is in many places actually below the high water level, and here it is often not the main river bund which proves inadequate but rather the banks of the small irrigating channels inland, the result being that the cultured plantation is converted into a swamp. Under these conditions weed growth takes place rapidly thus completing all the necessary factors for the ideal habitation of the mosquito, to wit, heat, moisture, slowly running or stagnant water and vegetation.

This flooding is not altogether without advantage, however for it enables a rich deposit to settle from the water on the land but it is hardly to be wondered at that malaria should be prevalent. The season lasts from April to December. The usual form met with is the benign tertian but the subtertian is not uncommon, and it seems probable that the advent of a large expeditionary force many of whom are Indian will increase the malignant ratio.

[illegible] I have found it [illegible] the [illegible] malignant [illegible] nature at [illegible] to Muskat the [illegible]

During the present commission the [illegible] serving first visited the Shatt-el-Arab in March 1914 [illegible] brief stay was made at Busreh then a Turkish port On [illegible] patriarchal Turkish official presented himself at the gangway with the query "Any rats?" Observing bewilderment on the face of the officer of the day, he forthwith courteously relieved that [illegible] of further anxiety on the matter by exclaiming, "No rats [illegible] well, good bye!" and precipitately disappeared This was interpreted as signifying that the Turkish Government was satisfied there was no plague on board

This visit only lasted a few days and no malaria followed Our second visit took place in September 1914, when we proceeded to Mohammerah, remaining there for about a fortnight At this time relations were becoming strained with Turkey, and one hot forenoon a Turkish officer came on board with instructions from his Government requesting us to leave Reply was made that the representation would be at once transmitted to the proper quarter, but that pending reply the ship must remain

The officer was then offered refreshment but to the general consternation asked for sherbet The Goanese steward was determined not to be defeated, and quickly produced what was apparently the required beverage, which was pronounced by the emissary as most excellent The latter then hurriedly departed On inquiry, it was ascertained that the said beverage consisted of lime juice and water in which was incorporated, however, a very generous percentage of Eno's fruit salt

We left a day or two later and war followed almost immediately Five cases of malaria resulted from this visit to the Shatt el Arab, all of which were benign tertian

Throughout nearly the whole of 1915 the ship was in the Shatt el Arab and during that period forty-seven cases of malaria occurred Of these forty-one were tertian the remainder being subtertian the average time patients remained on the sick list being a week During the greater part of the year 20 gr of quinine were given weekly to each member of the ship's company as a prophylactic but it became evident that this amount was insufficient and when larger doses were employed, it was comparatively uncommon to get malaria in any but those who had

already had an attack The general tendency was for benign attacks, if repeated to ultimately become malignant Parasites were nearly always easy to find even in the pyrexial stage, whilst in the malignant form double infection of the red cell was often observed

As regards differential diagnosis, the conditions particularly liable to simulate malaria are typhoid, sandfly and simple continued fever The points to be chiefly relied upon are, repeated examinations of the blood, Widal's test and the character of the temperature, but it must be remembered that the latter becomes unreliable as soon as the air temperature exceeds 98° F, an almost everyday occurrence in the hottest months A fever, which at first sight appears to be malaria but which lasts for more than a week, is very likely, in the absence of parasites in the blood or definite intermissions to be typhoid

The routine treatment has been quinine in solution by mouth, which has always cut short the attack The daily doses employed have been 20 gr for the first three days commencing in the sweating stage, followed by 10 gr , for three days and then 5 gr for a week, the latter usually combined with tonics Following this a regular amount of quinine is given weekly, the amount depending on the time of year

With regard to prophylaxis during the months January, February, and March, mosquitoes disappear and all that is necessary is 10 to 20 gr weekly to all old cases From April to December more vigorous methods are required, and it has been found in this ship that 30 gr of quinine a week to each man is the minimum dose that can be considered an effective preventive Probably as good a way as any of giving this is in a 5 gr dose taken with breakfast on six mornings in the week Screening the ship, in the excessive temperatures met with, when heat stroke even amongst upper deck men is hardly uncommon, is a measure quite out of the question All that can be done in this way therefore, has in the provision of mosquito sleeping nets, which are employed These, undoubtedly, ward off many bites, but many are still received in the evenings and when messing between decks

It has been observed that the natives at sunset, light their cooking fires usually to windward of their huts and it is reasonable to suppose that this is done to drive away mosquitoes A similar sort of measure, especially suitable for employment in the living spaces on board ship, consists in the use of katol sticks, which are comparatively cheap and easily obtainable from India These are

allowed to smoulder and give off a vapour which at once drives away or is fatal to mosquitoes In the Royal Indian Marine a regular issue of this is made for use on the mess decks and has proved most effective

In the Shatt el Arab the main preventive of malaria in the future must lie in attacks on the breeding grounds and, doubtless when peace comes once more, a vigorous campaign can be made At Basreh where ships chiefly lie, swamps and stagnant pools should be totally preventable by adequate bunding and proper systems of drainage All weed growth could be cleared from the irrigation channels and then the numerous fish therein would more readily see and devour any larvæ Lastly, natives and others could be prevented from storing their water in open receptacles, as is largely done at present a practice which is a prolific source of breeding

THE ANKLE JERKS OF A SHIP'S COMPANY

By [illegible] Surgeon MILDRED CAILLE, M.A. [illegible]
M.R.C.P. [illegible]

*[illegible] to the Royal Naval Hospital, [illegible]
[illegible] Hospital, Greenwich; Assistant Physician [illegible]
[illegible] to the West End Hospital for [illegible]
[illegible] to the Victoria Park Hospital for [illegible]
[illegible] Medicine in the London School of Clinical [illegible]*

In this paper it is proposed to [illegible] the results of examination of the ankle jerks of a large number [illegible] men. With the permission of four officers every man in H.M.S. [illegible] was examined in this respect. An examination [illegible] those who were in the ship temporarily [illegible] opportunity.

Importance is attached to the fact that every examination was made by the same observer. Of the 1,052 men dealt with no exception (Case 1) considered that they were healthy and strong. The ages of the men varied from 50 to 16.

Total absence of one or of both ankle jerks was found in fifteen cases. The remaining 1,037 were normal in this respect. Reinforcement was necessary in the case of forty-nine men before the jerks could be obtained, and in a few cases the result was achieved only with the aid of a heavy hammer. It was found occasionally that the outer side of the tendon was more responsive than the inner side [1]. The greatest care is needed before the jerk is declared absent. Not infrequently the jerk which is apparently absent, is found to be normal at the next examination.

The expressions 'ankle jerk,' or 'Achillis jerk' are those in common use until the phenomenon comes under the heading of the so-called 'tendon reflexes.' It should be remembered however that it is not a true reflex movement. It depends for its existence on reflex muscular tonus. When the condition of the jerk is examined in the manner described in a previous paper [2] that is with the knee-joint flexed, a positive result depends upon the solens possessing this reflex tonus.

[1] This paper is a continuation of the article entitled "The Diagnostic Importance of the Ankle-jerk," which was published in this Journal, April 1916.

[2] *Lancet*, Journal of April 10th, 1915, p. 785. In multiple neuritis in which the motor fibres are affected should read "In multiple neuritis in which the motor and sensory fibres are affected."

[illegible] tested the calf muscles are squ[illegible] ensure [illegible] This also brings before th[illegible] any [illegible] the muscles In some cases of [illegible] [illegible] is associated with a diminution in the [illegible]

[illegible] Surgeon A Sanders R N has called [illegible] attention to the fact that the ankle-jerk is sometimes obtained when the calf muscles are struck and not when the tendon is struck I have been acquainted with the calf reflex for some time but I must plead guilty to having considered that when the tendon reflex was absent the calf reflex would be absent also and to having been satisfied with this consideration It is not the case however and in a large number of patients whom I have seen recently, and who have had absent ankle jerks from a variety of causes, I have been able to demonstrate brisk calf reflexes In a few cases both the calf and tendon reflexes are absent Perhaps the presence of the former and the absence of the latter in the same patient bears some relation to the stage of the disease I have not yet seen a case which showed a normal ankle jerk and an absent calf reflex The reflexes would appear therefore to be independent [3]

Of the fifteen abnormal cases three were the result of former infantile paralysis (Cases 1 2 and 3) Two men had evidence of sciatic neuritis (Cases 4 and 5) In one case (Case 6) the diagnosis of tabes was made without any difficulty and confirmed by an examination of the cerebrospinal fluid The remaining nine cases were not so straightforward It was proposed to lumbar puncture Cases 7 to 12 inclusive but by an unfortunate choice of date, the writer was appointed to Haslar when this had been done only in Cases 11 and 12 The diagnosis of the remaining cases therefore, is still uncertain (this is true also of Cases 11 and 12) and the reader will be able to come to his own conclusions from the facts which the clinical notes tell him The notes are given in brief but a careful clinical examination was made in each case and the neurological point of view was not made more dominant than the facts justified

Case 1.—G P aged 29 writer At age of 15 he had some illness affecting his legs but was never laid up He was turned over to the writer's department Gait awkward Both calves atrophied and anterior tibial muscles very weak Knee jerks normal Ankle-jerks both absent Unable to stand on heels or toes

Case 2.—C S aged 28 leading stoker Found to have no ankle jerk on right side Knee jerks normal Gait normal Right calf measured 12 in left 13¾ in Very slight weakness of dorsi flexors of

right ankle He said that as a boy he used to drag his right foot for about a week He never saw a doctor

Case 4.—J S aged 41 stoker R N R Found to have no ankle jerk on left side Left calf measured 12 in right 13½ in Knee-jerks, gait &c normal He said that he had never been laid up and did not know that there was anything the matter

These three cases were examples of former acute anterior poliomyelitis

Cases 4 *and* 5.—G P aged 29 private R M L I and F W, aged 32, gunner, R M A Both found to have absent ankle jerks on the left side and showed other evidence of slight sciatic neuritis When questioned they both recalled former cramps in the legs

Both these men had lost the gluteal fold on the affected side [4] I have not seen this fact described before, but I attach considerable importance to it in the diagnosis of sciatic neuritis There was no flexion of the thighs

Case 5.—G P aged 41 chief E R A This man complained of nothing and considered that he was in perfect health His ankle jerks were absent also his knee jerks His pupils were unequal and reacted sluggishly to light and his gait was a trifle unsteady with his eyes closed His bulbo-cavernosus reflex was absent No other abnormality was detected The cerebrospinal fluid contained fifty lymphocytes per cubic millimetre but the Wassermann reaction was reported to be negative The blood was not tested Lues was admitted

Case 7.—J P aged 42 stoker single man No complaints Ankle jerks both absent Calves alone insensitive to firm pressure Bulbo-cavernosus reflex not elicited No other abnormality was detected except that he had medullated optic nerve fibres visible to the left fundus Lues at 33 and had salvarsan in 1912 He said that the Wassermann reaction of his blood was negative in 1913 and 1914 Tabes dorsalis had to be considered, but it could not be confirmed for the reasons given above

Case 8.—J W aged 38 stoker P O single Both ankle-jerks absent Achilles tendons and calves absolutely insensitive to pressure and testicles but slightly sensitive Bulbo-cavernosus reflex not elicited Lues denied Blood and cerebrospinal fluid not examined

I am not quite certain in my own mind of the exact value to be placed on the absence of the bulbo-cavernosus Of my series it was absent in Cases 6, 7, 8, 9 and 11 It is said to be abolished frequently in early tabes I tested it in a number of men to their great amazement, and found it absent almost as often as I found it present As a rule when it is present there is no doubt about it It may be that in my cases some blunting of the normal sensibility had occurred at the extreme proximal end of the reflex arc We can say that the presence of the reflex indicates an intact reflex arc at the level of the third sacral segment

Case 9—C K, stoker P O, aged 39, married wife [illegible] Right ankle jerk absent Left normal Has had cramp [illegible] leg for a year or so but has never required a doctor The [illegible] worse Complete analgesia of ulnar nerves at elbow, [illegible] tendons, with partial analgesia of testicles Bulbo cavernosus reflex absent Lues not admitted Blood and cerebrospinal fluid [illegible] Probably a case of tabes No other abnormality was [illegible] The optic discs were not examined

Case 10—G L aged 30 E R A, married Right ankle jerk absent with reinforcement Bulbo cavernosus reflex active Achilles tendons absolutely insensitive to pressure calves and testicles nearly insensitive Says that his right sole has been cold for about a year and that his right great toe nail has dropped off painlessly about sixteen times during the last five years His left great toe nail came off also several times but has not done so during the last two years His right toe nail was seen to be black Gonorrhœa was admitted His wife has had one miscarriage and her two children twins, died as babies

It was exceedingly unfortunate that no opportunity was afforded of examining this man's cerebrospinal fluid, in order to prove or disprove the question of tabes

In all cases a complete examination was made of the sensibility of the skin to cotton wool touches to temperature and to pin pricks, of the sense of vibration of the tuning fork of muscular weakness wasting and ataxia of the condition of the deep superficial, and organic reflexes of the sense of joint position, of the condition of the pupils cranial nerves, optic discs and visual fields, of the muscular tonus of the presence of trophic disturbances &c Inquiries were made into the question of sexual power lightning pains, previous diplopia, &c In each case the facies and mental condition were normal and in no case was it evident that alcohol was a factor in the abolition of the jerks Examination of the heart and urine detected no abnormality

Case 11—C R aged 39 carpenter's crew Absence of the left ankle jerk detected Cremasteric and bulbo cavernosus reflex absent on repeated examination Joint sense abolished in toes only on each side Old depressed scar on vertex from injury in childhood

This rating denied sexual intercourse and although I believed him I was anxious to prove that he had not an early para syphilitic condition His cerebrospinal fluid proved to be absolutely normal and gave a negative Wassermann reaction The diagnosis remained uncertain

Case 12—W R, aged 39 A B, R F R Absent left ankle jerk Joint sense absent in toes of right foot only Some diminution of tenderness on squeezing calves and testicles No other abnormality detected, and with so little to work on a certain diagnosis was not possible

The cerebrospinal fluid was normal and gave a negative Wassermann reaction

Case 13.—T. D., aged 18, stoker. Total absence of ankle jerks and knee jerks. No other abnormality detected. Bulbo-cavernosus reflex active. Venereal disease denied. There was nothing in the past history or family history to help in our enquiry.

Finally, Cases 11 and 13 were two wardroom officers in whom I entirely failed to elicit the ankle jerks even on repeated examination, and with various forms of reinforcement. In one case I thought once that I did just elicit them, but I was very uncertain. Neither of the officers presented any outward evidence of illness which could be detected by the most minute during an intercourse of eighteen months and six months respectively. As no complete examination was made of these two men it will perhaps be better to be satisfied with a mere allusion to them rather than to include them definitely among the statistics brought out by the examination of the ship's company.

Enough has been said to show the real importance of examining this 'reflex.' Ten years ago Ferrier [5] remarked that the best known and most commonly tested tendon reflex was the knee jerk, though the Achilles jerk is of equal or even greater importance, and yet but little attention is paid to it by the profession as a whole. We are now from our own researches able to say that its absence is evidence of a pathological condition. In no case out of the first thirteen of our series was its absence unassociated with any other abnormal condition.

I wish it to be noted particularly that in the case of fourteen out of fifteen men such discoveries as were made were the result of [illegible] search. The men complained of nothing.

I lay no particular stress on the absence of the joint sense when confined to the toes only. It is surprising to think that this can occur in health. But I have met with it so often that I can hardly doubt that it does do so.

There can be no question that every man who is investigating disease from a clinical standpoint should possess and use a percussion hammer. It is of equal importance with the stethoscope. A well balanced pen-knife makes a fair substitute on occasion.

It must be remembered that loss of the Achilles-jerk may be the only sign of affection of the nervous system in cases of rheumatism and diabetes. I have seen several such cases in rheumatics. Presumably it is the solitary sign of a neuritis. On one occasion I based my report in a compensation case on the

absence of the ankle jerk in the limb in question. Fortunately I determined to see the man again, and on this occasion the jerk was elicited.

I look upon Cases 8, 9, and 10 as most probably instances of tabes. Their future will be eagerly watched as far as it is possible for me to do so. With reference to Case 13, congenital absence of the knee jerks has been looked upon as one of the stigmata of degeneration (so also have umbilicated optic nerve fibres, Case 7), and no doubt absence of all the deep reflexes may be explained in this way, but unfortunately such an expression does not help us to know in what way—anatomical, pathological, physiological—the possessor of such a stigma differs from normal people. In any case a stigma of this kind is so exceedingly rare that it need hardly be taken into consideration. Just recently I have seen a dull witted young man, aged 20, whose ankle jerks were both absent and who presented no other signs of disease.

The examination of the ship's company took place in January, 1916. This is mentioned in the interest of future investigators of the abnormal cases. The lumbar punctures were made on board, and the fluids were examined by the Director of the Royal College of Physicians of Edinburgh, to whom they were posted. My best thanks are tendered to him and to my old shipmates for their hearty co-operation in my investigation.

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A BATTLESHIP IN ACTION

By Fleet Surgeon E A Penfold MB DSO RN

It is thought that a short account of the experiences of the Medical Officers in this ship during the Battle of Jutland on May 31, 1916 and afterwards until our return to the base, may be of interest to other Medical Officers, as they differ somewhat from those so ably described in the October, 1915 number of this Journal inasmuch as most of our arrangements and general organization were upset early in the Battle owing to the Fore Medical Distributing Station (which was our principal dressing station) and the Medical Store adjacent, being completely wrecked by an explosive shell so that all the most important medical stores, surgical dressings and instruments were either destroyed or rendered useless, at the same time as most of our serious casualties occurred

In ships of this class there are two Medical Stations arranged for in the design of the ship the larger one in the fore part situated on the middle deck amidships and the smaller one in the after part of the ship on the same deck but nearer the ship's side The former was regarded as being in as safe a situation as could be obtained and the space provided as well as the ventilation fixtures and fittings in the station were most satisfactory and a very great improvement on the accommodation provided in ships of an earlier class

The After Station was regarded as not quite so well protected and it was recognized that it might be necessary to abandon this Station during action and for the medical party stationed there to take up another position further away from the ship's side Both from its situation and accessibility, as well as from its much larger size, the Fore Station was therefore recognized as the principal one in all respects

Medical Parties

Besides the Medical Officers and Sick Berth Staff, the medical parties consisted of the Chaplain, Fleet Paymaster, an Assistant Clerk and various ratings detailed to assist the Medical Officers in action as well as those told off and drilled as stretcher parties they were divided into two groups as follows —

(i) In the Fore Station were the Fleet Surgeon, one Surgeon Chief Sick Berth Steward and two Sick Berth Attendants, assisted

by the Chaplain, Fleet Paymaster, two Ship's Stewards two Ship's Cooks, two Officers' Cooks and two Officers' Stewards to all of whom special duties were assigned. Attached to the Fore Station and taking shelter there were five stretcher parties with one field stretcher and four Neil Robertson stretchers the field stretcher being manned by Cooks' Mates two of the Neil Robertson's stretchers by Musicians, and two by Officers' Stewards a leading hand was in charge of each stretcher party and was provided with a first-aid haversack.

(2) In the After Station were the Senior Surgeon Second Sick Berth Steward and one Sick Berth Attendant assisted by the Assistant Clerk Chief Writer and two other Writers two Ship's Steward Assistants Officers' Messmen and Cooks. Attached to the After Station and located in the flat just outside it were three stretcher parties with one field stretcher and two Neil Robertson stretchers, manned by Officers' Stewards and Officers' Cooks Mates, each being in charge of a senior hand with a first-aid haversack.

The medical parties (including the stretcher parties) had continually received instruction in first aid from the Surgeons during "action stations" and those not previously qualified had been examined and passed out by me after the first three months of the commission. The stretcher parties were continually drilled at their duties during the weekly 'exercise action,' and were frequently sent for to various parts of the ships by the Commander when exercising the "repair parties" or "fire parties." The 'fire' and 'repair' parties also received a little elementary instruction in first aid especially as regards the treatment of burns and scalds, and the arrest of hæmorrhage being sent to the Surgeons for instruction a few at a time as they could be spared. The gun crews had all received a course of instruction in first-aid either at Whale Island or in barracks after they had been detailed for this ship, but before commissioning, afterwards they were given additional instruction when they could be sent to the Medical Officers for this purpose. Demonstrations in first-aid and ambulance work had been given by me during the previous winter evenings to Ward-room Gunroom and Warrant Officers separately, and all three courses had been very well attended.

First-Aid Dressings.

Adjacent to each 6-in. gun on the battery deck is a small iron tank or cupboard (measuring 11 by 10 by 7 in.) originally intended for stowage of cleaning rags &c. for each gun's crew but which

was [illegible] perman[illegible] are div[illegible] and in these are kept [illegible] dressings for burns first field dressings and packages of lint cotton wool bandages safety pins &c sterilized and sewn up in mostig battiste covers, orders are given for these not to be touched except in action, and the cupboards are kept fastened by a butterfly screw being only opened for weekly inspection by a Medical Officer a red cross is painted on the flap door of each cupboard Besides these two large tin dressings boxes (measuring 20 by 12 by 10 in) are kept full of additional dressings bandages, tourniquets safety pins, scissors bottles of surgical iodine solution &c these boxes are kept locked up with a padlock which is taken off during action A red cross is painted on their lids and when preparations are made for 'immediate action, they are placed at the fore end of the battery deck, port and starboard For all other isolated positions haversacks are provided containing packages of lint cotton wool bandages, safety pins &c sewn up in mostig battiste also picric acid dressings first field dressings tourniquets and scissors the quantity of dressings contained in the haversack differing according to the number of men in the station to which they are assigned Forty-seven of these haversacks are provided each being sealed up with wax and having painted on it besides the red cross the name of the station for which it is intended, they are kept in the Medical Distributing Stations and are served out to the ratings told off to take charge of them whenever preparing for action

Stores kept permanently in the Distributing Stations

(1) *In the Fore Station* —Operating table, basin holder and instruments table, instrument chest one medicine chest (complete), two emergency surgical dressings chests cases of izal and formalin, X ray apparatus and ice-chest In the cupboard and drawers provided are kept surgical dressings of all sorts, iodine, carbolic acid, antiseptic paste, perchloride of mercury tablets, morphia in solution and in tabloids, Wildey's syringe &c cotton shirts and towels, operating gowns and white clothing are kept in tin boxes and large quantities of splints, made by the carpenters of thin three-ply wood which can easily be cut down if required, are kept on the shelves Twelve bamboo and canvas stretchers were kept hanging in tiers of three in the Fore Station, and it was arranged that others could be fitted up in various bathrooms if required

were kept permanently [illegible] After Station but six more can be slung in the flat of [illegible] adjacent to the Wardroom Officers bathroom All [illegible] dressings and stores not actually required for use in the [illegible] work in the sick bay were kept in the Medical Store [illegible] quent to the Fore Station and accessible during [illegible]

Usually when ordered [illegible] to action there had been plenty of time [illegible] the sick bay till the other articles required in the Distributing Stations, as well as all books papers, and documents which [illegible] importance and this had been done on many occasions [illegible] so that the sick berth staff and ratings told off to assist would [illegible] get the sick bay dismantled and everything important [illegible] quickly, knowing exactly what was required to be done On March 4th the time for preparation was very short, and when [illegible] sounded it was known that the enemy had been sighted [illegible] medical parties and sick berth staff immediately proceeded to remove all the stores remaining in the sick bay to Distributing Stations or to the Medical Store The sick berth beds and bedding were removed to the store where they would be available when required all the remaining instruments for ready use sterilizer electric heater instrument trays, urinals and other requisites in daily use in the sick bay or operating theatre were taken to the Fore and After Stations the medical history sheets had been packed in a special tin box and were also removed to the Fore Station and as much of the furniture as could be stowed there to the Store Room In twenty minutes after the action sounded, and before the firing commenced, the sick bay was stripped and the watertight hatchway leading to it closed down Those of the patients on the sick list who were considered fit to go to their proper action stations had been previously warned to do so, if there should be an action, but on this occasion there were unfortunately, several more cases than usual on the sick list chiefly owing to a number of boys and ordinary seamen having been vaccinated recently, and some of them had been placed on the sick list as cot cases that day, with febrile condition and painful arms, these had to be accommodated in the Fore Station, as well as a few patients with injuries such as sprains, &c who would not have been of any use in their proper action stations

When the action commenced all the arrangements in the dressing stations had been completed, the necessary instruments sterilized and laid out in trays lotions made up morphia solution in Jena bottles, &c., and the staff clean and ready for their work. Only one slight casualty had come to the Fore Station during the first hour of the action and this had been dressed, the man would have been sent back to his post, but just after dressing his wound a heavy shell burst close to us in the fore part of the ship and completely wrecked the Dressing Station and Medical Store causing many casualties in this part of the ship.

On recovering from the effects of this explosion, it was found that all the lights were out in our compartment which seemed to be filled with debris, and the air thick with smoke from the adjoining store room which was on fire but no flash had been felt and no nitrous fumes were noticed. water was rushing in (from burst pipes) and the compartment was quickly flooded. the uninjured men were crowding towards the corner of the compartment where there was some light from the deck above coming through the hatchway. All the unwounded were sent up as quickly as possible, but there was a little delay owing to the ladder being damaged by the explosion. In two or three minutes the place was cleared of all except the Medical Officers and sick berth staff and those who were helpless. Surgeon Margetts and myself were practically uninjured and were able at once to attend to the wounded with the assistance of one sick berth attendant (who was afterwards found to be slightly wounded in the leg by a shell splinter) the other two sick berth ratings stationed with us were both found to be seriously wounded, and one died shortly afterwards. Several Neil Robertson stretchers were found in the least damaged part of the station, and the wounded were fastened in them as quickly as possible and carried up to the deck above, where they were laid either on mess tables or on field stretchers on the deck, and a temporary dressing station was arranged on the stoker's mess deck.

All the wounded from the fore part of the ship (where most of the casualties occurred) were afterwards brought to this station. Very little in the way of dressings was salved from the Distributing Station or Medical Store as what was not destroyed by shell explosion or fire was damaged by water so that at first only temporary dressings which could be obtained from the nearest guns or isolated positions were available, but as soon as there was a lull in the action a surgical emergency dressings chest was brought from the After Station, the two in the Fore Station being

much damaged apparently though afterwards most of the contents were found to be serviceable The Wildey's syringe and bottle of morphia solution which were carried on my person had not been broken, and at first none other was available all the other hypodermic syringes and prepared solutions of morphia having been destroyed although later on others from the emergency chests and field haversacks were obtained I may here state that the Wildey's syringes were found to be most valuable both by myself and by the surgeon stationed aft their only defect being that the needles are too fine and very easily broken Telephonic communication between the two stations had of course been interrupted when the Fore Station was put out of action and no other communication was possible until there was a lull in the action but when this did occur, the second sick berth steward was sent for to assist in the Fore Station, and some dressings and other necessaries such as urinals feeding cups &c , were obtained It was now reported to me that Surgeon Lyster had found it necessary to abandon the After Station The Surgeon and party of men with him had removed to the engineers workshop and store-room which had been quickly arranged for their use, with the able assistance of the chief stoker in charge there Many of the cases of serious burns, which resulted from cordite fires were dressed in this temporary station and the patients made as comfortable as was possible there, until it was safe to have them removed to a less well protected part of the ship

A few of the severe cases of burns, as well as all those wounded in the fore part of the ship had been removed to the temporary Fire Station on the stokers mess deck and dressings and splints were applied there and hypodermic injections given to all those requiring them the chief difficulty was to cleanse the wounds, which were of course in a very dirty state even cold water was at first only obtained with difficulty and no hot water was available until much later when it was safe for cooks to return to the galleys, and the amount was then limited to what was required for bovril, tea cocoa &c until the fresh water supply pipes had been repaired

Lubin and methylated spirit were obtained from the dressings boxes, and this was the only antiseptic available when first the wounds were dressed

Mortality —It was found that eighteen had been killed outright by shell explosion in the fore part of the ship eight others afterwards died of wounds the majority during the evening of May 31 A mortuary was established in a screened off part of the mess deck

in the compartment before that used for the temporary dressing station until the dead were all removed there either by the Communication repair parties or by the medical party. Large quantities of disinfectant solution were required for use in the mortuary. At first only a few tins of oral were available but later a case of oral was obtained from the After Station as well as disinfectant solution from the carpenter's stores.

Cases which died of Wounds.—Most of these had sustained multiple injuries from shell explosion, several of them had one or more compound fractures, especially of the lower limbs and particularly the thigh, associated with large gaping wounds from shell fragments elsewhere. One case was that of an able seaman with a compound fracture of the cranium, who lived for several hours although the left side of the skull was blown away and the brain exposed and lacerated; another patient who had been resting in the Medical Station sustained a compound fracture of the spinal column in the dorsi-lumbar region, the injury being caused by a fragment of shell about the size of a man's fist; he was entirely uninjured elsewhere and lived until the early morning of June 1. One case of severe burns of the head and trunk with multiple wounds from shell fragments, died almost as soon as his injuries had been dressed; another case of compound fracture of the thigh with severe lacerated wounds on both sides in the region of the hip joints and lesser wounds of the legs survived until the morning of June 2. These patients had all been wounded either in the Fore Medical Distributing Station or in a part of the ship near it and it had been possible to remove them direct at once to the temporary dressing station for treatment. Another man who had been stationed in a more distant and isolated position had been struck by a large piece of shell at the same time as the others were injured but could not be removed till later when there was a lull; he was found to have sustained a compound fracture high up in the thigh and of the foot the lower part of the abdomen being also injured. He was temporarily dressed by a Medical Officer, and later removed in a Neil Robertson stretcher to the stokers mess deck, where treatment of his injuries and of shock were given but he died about an hour after his removal.

Other Casualties.—Besides those who were killed or died of wounds forty two other casualties occurred, twenty-seven of which were burns (nineteen severe and eight slight), thirteen were cases of wounds (five severe and nine slight) and there were two cases of

both wrist and [illegible] [illegible] [illegible] cases one had sustained a compound [illegible] of the [illegible] with laceration of the thumb higher up, as well as a punctured wound of the abdominal wall caused by a fragment of shell another was found to have sustained a severe contusion of the [illegible] neum, resulting in ruptured urethra as well as a compound fracture of one foot near the ankle joint and wounds of the other foot one case of scalp wound caused by shell fragment was also suffering from the effects of nitrous fumes and was therefore regarded as a severe case of injury another case, at first regarded as a slight one was that of a deep punctured wound in the groin, apparently caused by a fragment of shell remaining in the wound

The slight cases of wounds were mostly caused by shell splinters or fragments but some were cases of severe contusions and abrasions due to men being violently thrown as a result of shell explosion

Burns.—Most of the burns occurred in 6 in gun crews or ammunition parties and were due to cordite burning but a few were sustained in the engine room department caused by flash from shell explosion passing down a ventilating trunk In all cases these burns were of the face neck and hands the forearms also being generally burned in the case of seamen in nine of them were the parts of the body covered by clothing burnt and in none of them were the eyes damaged although the eyelids generally suffered severely These cases were all dressed with picric acid dressings but in some cases oil was applied to eyelids, nostrils and lips, where the picric acid dressing could not be satisfactorily kept in position In most cases the protective was used in order to keep the dressings moist, and although those which were kept moist were more easily removed, they more quickly became offensive than those in which no protective was used, nearly all the burns were highly septic and could not be satisfactorily cleansed before being first dressed These cases were nearly all redressed in the morning (June 1) and all of them were again dressed in the evening by which time they had become very offensive and many of them were so painful and the patients themselves so restless that it was difficult to keep their dressings properly applied Injections of morphia (¼ gr to ½ gr) were given in nearly all these cases of burns Most of them again required dressing on the morning of June 2

Arrangements after the Action.—It was not until the afternoon of June 1 that the "secure" was sounded and the sick bay

compartment could be opened up, it was then found that the bay was practically undamaged, and it was quickly prepared for the reception of patients. Beds and bedding were obtained from the ship's steward to replace the sick berth bedding which had all been destroyed in the Fore Distributing Station and Medical Store. As many of the patients as could be accommodated there were removed to the sick bay, especially those which required more thorough cleansing and dressing of their injuries which was carried out in the operating theatre of the sick bay by Surgeon Margetts and myself. Two of those dangerously wounded (one of whom died next morning) were not removed from the mess deck but were kept there in cots, a space being screened off for them and an attendant remaining with them. Most of the cases of burns which could not be accommodated in the sick bay when removed from the engineer's workshop and store-room were placed in the chapel (aft) which was undamaged in the action and proved a very satisfactory place for this purpose. The chairs all being removed and the patients laid in beds and hammocks spread on the deck. It was then possible to give individual attention to them all. Several of the ratings who had been trained in first aid whose services could be spared volunteered to continue nursing the patients and this service was of the utmost importance to the Medical Officers because of the small berth staff being so depleted and those remaining considerably limited by the prolonged strain of the previous twenty-four hours.

Nearly all the cases of burns required feeding with feeding cup [illegible] and frequent relays of hovril soup, cocoa and milk foods [illegible] obtained from the galleys and distributed amongst the patients. The volunteer nurses attended to the feeding of all the helpless patients as well as providing them with urinals, bedpans, [illegible] when required. Two of the assistants who were writers took [illegible] and full particulars of the patients. I may here [illegible] that I am deeply grateful to these assistants for the way they gave their help in time of stress although themselves badly in [illegible] and I was surprised as well as pleased at the skill and [illegible] with several of them showed in nursing their suffering [illegible].

Surgeon Lyster remained in charge of the patients in the [illegible] assisted by volunteer nurses and he redressed cases there [illegible]. The second sick berth steward and the uninjured attendants were [illegible] for nursing purposes to the sick bay and on the [illegible] mess deck with two volunteer assistants.

W[illegible] w[illegible] the f[illegible] fully in the afternoon one o[illegible] side us and the hospital patients [illegible] being discharged and nine (s[illegible] the ship for treatment. The cot cases were [illegible] from this ship to the hospital ship [illegible] cot-carrier or to hoist any of the [illegible] working party the transfer was very [illegible]

After history of some of the C[illegible]—We [illegible] been able to trace the after history of nin[illegible] hospital only one of the serious cases (burns) died [illegible] June 20). Of other who was severely burn[illegible] was [illegible] in hospital and ten weeks afterwards on sick l[illegible] in the [illegible] months was eight weeks in hospital and four weeks [illegible] but in case two did not return to the ship. Another [illegible] return to August 23, was hit only for light [illegible] forearm, [illegible] afterwards the left forearm, wrist and hand [illegible] and the cheek and the cicatricial skin tending to [illegible] Several of the other cases returned to the ship after periods varying [illegible] in hospital, followed by two in three [illegible]

Of the severely wounded patients [illegible] compound fracture of the leg and perforation of the abdominal wall, was in hospital for five months [illegible] with a fairly satisfactory recovery but [illegible] age he will probably not return to active service. The patient who had compound fracture with lacerated wounds of the [illegible] as well as ruptured urethra had an amputation of the [illegible] performed in hospital but otherwise is completely cured.

The case of scalp wound with symptoms of poisoning by nitrous fumes made a good recovery and returned to the ship about six weeks after he was sent to hospital. The case of punctured wound of the groin due to shell fragments was only about five weeks in hospital, but did not return to the ship till much later.

Application was made by the captain for the wounded to return to the ship, if possible, when again fit for active service as they had all made special requests to be allowed to do so. Twenty of the thirty-three patients sent to hospital did return, and of these five have since been discharged as cases of neurasthenia apparently resulting from the effects of the action. Several of the others who returned from hospital were affected to a lesser extent but gradually improved and are now apparently quite well again. One man who

had only [illegible] hospital for three weeks for burns of face and hands [illegible] tremors of the hands and was unable to continue [illegible] wardroom servant owing to this cause. The others [illegible] from insomnia and persistent headaches.

Insanity.—[illegible] shortly after the action and apparently as [illegible]. The patient was an artificer and was not wounded [illegible] that he had been much distressed and upset by [illegible] killed near to him as a result of shell explosion. He was sent to hospital four weeks after the action, and was subsequently certified insane.

Lessons learned from the Action.—(1) That only the Neil Robertson stretchers should be used for transporting wounded to the dressing stations, the field stretchers being utilized for accommodation of the wounded afterwards.

(2) That cot cases on the sick list should be as few as possible in war time and that such cases as are quite unfit for duty at [illegible] stations should be sent to the hospital ship at the base if possible before the fleet goes to sea, especially such as are unable to walk or take care of themselves.

(3) That it is preferable to have two Medical Distributing Stations of equal importance in a central position in the ship, if such can be obtained in a well-protected part. In this ship [illegible] the Battle of Jutland the Distributing Stations have been arranged in strongly protected situations near the centre of the ship, one on the starboard side abaft a watertight transverse bulkhead and the other on the port side before the same bulkhead, both are similar as regards [illegible] and accommodation, so that the [illegible] and equipment are divided between them as equally as possible. Well protected accommodation for the stretcher parties [illegible] has also been arranged for in the hammock and [illegible] rooms adjacent to the Distributing Stations.

[illegible] of a prearranged signal made from the conning [illegible] known below which side of the ship is engaged in the action, so that if the port side is engaged, all the stretcher parties [illegible] not absolutely required to remain on that side can at [illegible] with their stretchers &c. to the starboard side [illegible]

(4) *The Importance of Protection from Flash or Flame.*—More than half the casualties in this ship (exclusive of those killed or died of wounds) were cases of severe burns, as these burns were almost entirely confined to the exposed parts, viz., face, neck, hands and forearms, it is evident that these injuries would be rendered

[illegible] the person is uncovered [illegible] exposed to flash [illegible] the wearing of non-inflammable [illegible] and gauntlets [illegible] specially exposed to the [illegible] or flash from shell explosion is a wise precaution. These articles must be of such a kind that they can be worn for several hours if necessary, without much discomfort; therefore the material must be thin though fire proofed, and the eyes, nose and mouth must be exposed (except in the case of those actually engaged in putting out fires or working in dense smoke or fumes). The relatively small amount of surface so exposed to flash would render the burn sustained a slight one comparatively, and the injured man would probably be able to continue on duty after anointing the damaged part with an ointment or oil. From what has been learned in this ship, as well as from others in this squadron, the eyes themselves and inside of the nose and mouth are probably undamaged by flash. The repair and fire parties must of course be provided with a helmet which gives more complete protection, and which is only put on when actually engaged in combating fire.

As an additional dressing for burns sterilized olive oil with 5 per cent. eucalyptus oil and 10 per cent. lime water is now provided and kept in air-tight tins (easily opened if necessary) distributed in various parts of the ship. Boracic ointment is also provided at the 6-in. guns.

(a) *Accommodation of the Wounded after Action.*—As regards the various schemes for distribution and accommodation of the wounded, it seems certain that they must be kept in the Medical Distributing Stations or other equally well protected places, probably for many hours, until the ship is out of the danger zone and there is no likelihood of any further fighting. In our case in the Battle of Jutland, this period was one of nearly 24 hours from the time the action commenced; therefore it is desirable that canvas and bamboo stretchers slung in tiers should be permanently arranged for this purpose. In our present Distributing Stations, twelve of these stretchers are kept slung in each compartment without unduly interfering with the usefulness of the stations for their primary purpose, that is as first dressing stations. It is recommended that at least thirty more of these stretchers should be slung when preparing for "immediate action" in other well protected compartments, the necessary hooks, &c., being already fixed there permanently, and the requisite wire roping and stretchers kept always available in the Distributing Stations in the Medical Officer's charge; also that hooks for wire slings should be arranged

for [illegible] available in [illegible] possible [illegible] between [illegible] Hence [illegible] after the [illegible] although [illegible] probably [illegible] use the [illegible] it may be expected that there will [illegible] large spaces or flats which can be utilized after [illegible] there will be enough room to stow all the wounded [illegible] as on the deck.

Unless the [illegible] very bad indeed the rolling of a ship of this [illegible] the injured might be less disturbed by it than by the [illegible] of other wounded above or below them, if slung [illegible] of our own wounded, especially those suffering [illegible] were terribly restless, and I feel sure they were [illegible] comfortable lying on beds on the deck than they would have been on narrow [illegible] while it might have been necessary to have kept many strapped in to prevent them falling out of the stretchers. In the [illegible] smaller ships, where there is no possibility of obtaining any space large enough to accommodate the wounded on the decks the [illegible] system is, of course, most valuable and in any case should be arranged for in as many places as possible because no one can foresee what will be the after conditions in a ship badly damaged in action. Even in the largest battleship the [illegible] system should be used until all danger of further fighting is over, as the wounded must be accommodated in the best protected places available and these are comparatively small compartments.

(6) Another point which has been noted for future guidance is that it is not advisable that any of the wounded sent to hospital should return to the ship after recovering from their injuries. In this ship they were especially applied for because of their splendid behaviour after they were wounded and their own earnest wish to return to the ship; but, as has been mentioned previously, several of those who did return although not severely wounded showed markedly nervous symptoms afterwards, which possibly would not have occurred if they had been sent to other ships with entirely fresh surroundings.

SOMALI WARFARE: TWO LANDINGS AT LAS KHORAI

By Staff Surgeon F. J. M'Cowen, M.B.

The following medical report on the two landings at Las Khorai in British Somaliland on May 10 and 14 may be of some interest in giving one an insight into the features of most Somali fighting, and especially where the Dervishes are concerned.

On May 9, H.M.S. —— was suddenly detailed to go to Las Khorai, as news was received that the Dervishes had made a raid on the Warsangali tribe with the intention if possible of completely annihilating them and securing the port of Las Khorai.

We arrived at Las Khorai at 8 a.m. on May 10 and found the town in disorder. Several natives swam off to the ship and informed the captain that the Mad Mullah's tribesmen on sighting the ship were retreating. It was ascertained that the Dervishes, numbering about 2,500, attacked Las Khorai in the evening of May 6, descending on the town from the hills to the westward, and gradually surrounded the Warsangali forces of 1,200. The western part of the town was immediately captured by the enemy, and about 300 women and children murdered, and up to our arrival on May 10 intermittent fighting had been going on.

H.M.S. —— opened fire on the retreating Dervishes, accounting, for, as it was afterwards ascertained, considerably over 300 (excluding the wounded who were carried away by their own tribesmen).

At 10.45 a.m. I landed with an armed party from the ship to attend to the wounded. From the number of dead bodies seen strewn around on the beach from the ship, and from the results of the fighting ascertained from the Warsangali men who swam off from shore, it did not take long to decide to take enough dressings, &c., for a large number of wounded. I got a field chest, ammunition, and completely turned it out, refilling it with sufficient gauze, lint, cotton wool, and bandages to dress 200 cases. Besides this, a large bottle of iodine, a surgical pocket-case of instruments, silk sutures, perchloride tablets, bowls, stretchers, and a bucket of water from the boat containing the landing party, and sufficient bearers were landed. It was afterwards found that this supply, although sufficient, was not in excess, as practically all the cases as well as seen, were multiple wounds, some requiring as many as four and five dressings and bandages.

On landing we were met by hundreds of natives in a somewhat

exeitable condition but this was not to be wondered at, considering that they had been for four days fighting against superior numbers even up to the minute of our arrival Some had been without water for days, as the Dervishes after capturing the western part of the town held up the only water well, so that any Warsangali who tried at night to steal out from cover to get water had to run a very severe blockade with few chances of getting back again A number lost their lives in this way, but when one has to be without water under these climatic conditions especially after fighting in the blazing sun as these men had done all day there is no option but to run the gauntlet Some had almost succeeded and were actually drawing water when shot Their bodies invariably fell near the well and in the morning when first landing I visited the well on my way to attend to the wounded and near by could be seen three horribly bloated bodies which had just been fished out and had probably been in for days nevertheless the natives surrounded the well almost fighting amongst themselves in their eagerness to obtain some of the foul and polluted water

The smell on landing was very penetrating, which was not to be wondered at considering that the dead on both sides had been left lying about in all directions and the majority had been there for three or four days

The condition of the wounded was pitiful men women and children with all sorts and conditions of wounds had been left utterly neglected and many wounded and tortured woman and children thrown outside their huts presumably to die

The wounded as Captain —— describes it, 'appear to the Somali mind of negligible importance Certainly no help whatsoever is given to them by their own relatives or tribe It was difficult at first to ascertain where the majority of the wounded were and it was even more difficult to try and get the Warsangali fighting men less serious wounded to a selected spot in order to deal with the cases more quickly The town is divided into an eastern and western part with a large space between in which is the Sultan's residence and in the vicinity of which are a number of huts

After having treated all the wounded brought to the selected rendezvous each part of the town was visited in turn and all wounded in huts and those lying about outside were attended to

Between 11 a m and 4 p m there were approximately sixty cases attended to The nature of the wounds were bullet and stab wounds and almost every conceivable variety of these two was to

be seen. There were a few recently inflicted clean wounds but nearly all those of three or four days standing had become septic. There was no pretence on the part of the natives to treat the wounds, with the exception of a couple of compound septic fractures of the leg and thigh which had been put up too tightly in improvised splints and were on the verge of becoming gangrenous. These splints were also blocking any exit for a very foul discharge. All these were removed and the fractures properly attended to and put up in proper splints.

Before going into detail as to the nature of the wounds, it is necessary to say a few words regarding the nature of the weapons. The Somali has three weapons of warfare: (1) the rifle which is of two kinds: (*a*) the old 303 British, Lee Enfield carbine and (*b*) by far in the majority the French—Le Gras, whose bullet is of solid lead approaching .4 in size and so differing from the 303 which is of nickel with a lead core; (2) the other weapons are the spear or "hurba" which is about 5 ft. in length and (*3*) the knife or "jumbia" about a foot long which is strapped to the side. The Somali fights at close quarters and is all are not supplied with rifles, some having only spears and knives, the object is to kill an opponent with a rifle and secure his rifle and ammunition. In one of the spearmen who then casts his "hurba" aside for the more useful weapon.

The larger number of cases consisted of stab wounds which were gaping about 3 or 4 in. long, and varying in depth as to the part of the body where they were inflicted. They were invariably multiple in each person and commonest over the back, head and chest. As a few examples of some of these latter wounds there was one woman with fourteen stab wounds of the back, the majority penetrating into the lungs from which exuded frothy blood. On the same person there were also multiple wounds of the head and arms and nearly all the tendons at the left wrist had been completely severed. All the wounds were septic and clogged with mud. This woman was one of the two cases who eventually died. Another example was a pitiful case of a young girl thrown outside a hut to die and whom apparently everybody refused to look after, as was the case in most of those seriously wounded. She had multiple stab wounds (about fifteen) of the back, head, breasts, limbs and face (the left eye being nearly removed by one stab wound) and also a compound septic fracture of the lower end of the femur penetrating into the knee joint, the latter being the result of a bullet wound. She was lying face downwards and all wounds were

in direct contact with [illegible]
as in most other [illegible]
One would have thought that [illegible] would have been satisfied after inflicting [illegible] cowardly blows especially on women and young children but this is not the case, and the slaughter of women and children is unfortunately an unhappy feature of most Somali fighting and an invariable occurrence where the Dervishes are concerned

In regard to bullet wounds all manner and sorts were to be seen of the chest, face head abdomen and limbs The majority of those of three or four days standing had become septic Some examples were as follows One old man who had walked a quarter of a mile to have his wounds seen to had the floor of his mouth and his whole lower jaw (in front of the angles) completely shot away the tongue was also badly shattered and torn A considerable time was spent over this case, cleaning him up, paring off useless pieces of tissue and making the condition look respectable but when seen again later on in the day he had removed his dressings presumably to try and eat some food, and had to be redressed I did not see this old man again as when we revisited Las Khorai four days later it was ascertained that he had gone to the bush to another village, probably for a change of air (?) or to consult his own home man The native methods of treating wounds are somewhat primeval and not a little drastic The common method is to get a lump of fat tied to a piece of string heat it till it begins to run and then suspend it over the wound

There were other cases where the bullet had passed completely through the chest and the patients seemed to be fairly comfortable Again there were two cases where the bullet had hit the pelvic brim, fracturing this and lodging inside the abdomen In neither of these two cases were there any signs of peritonitis, although in both instances the injury had been sustained four days before being seen by me Compound fractures were fairly common and there were numerous cases of the bullets having passed through the fleshy parts of limbs missing the bones by fractions of an inch It was an extraordinary sight to see some of these people walking about, some with multiple bad stab wounds and others with gunshot wounds the majority being septic but apparently these people do not consider themselves incapacitated unless they are unable to walk One did not see in many cases the vast difference between the entrance and exit wounds one reads about in the medical journals in regard to the wounds sustained in France and other

theatres of [illegible]. This may have been because of the close range in fighting. The "Le Gras" wounds could [illegible] be picked out from those caused by the 303 "Lee-Enfield" on account of their naturally larger size, but even here there was no marked difference between the entrance and exit. The majority of those which had lodged "inside" and had not gone through were the "Le Gras".

No wounds in which there was even the slightest possible doubt of sepsis were sutured. The majority of the cases were thoroughly cleaned up with perchloride dried and then painted with abundance of iodine and dressed with cyanide gauze and cotton wool; and when seen again these wounds were in a much better condition than if they had been made into a pus poultice by the aid of dressings containing protective tissue. Wounds requiring longer attention were the compound fractures which always take some time to put up properly.

The ship left at 7 o'clock that night on other duties, but returned again to Las Khoral on May 14, when I again visited the wounded. In the meanwhile the Warsangah tribe had been immune from any further attack from the Dervishes. This time on landing twenty fresh cases were seen who had returned to the village from its immediate vicinity after the arrival of the ship. This made approximately eighty cases treated the result of the Dervishes' raid, and nearly all the sixty previously attended to were redressed. All the wounded, with the exception of two very serious cases who had died in the meanwhile, were found to be progressing favourably. Many of the fresh cases were like those previously seen, namely, gunshot and stab wounds a number being of a serious nature. All the cases were attended to and a large quantity of dressings was left with the Sultan; instructions were given as to their use and everything to ensure the comfort of the wounded was done. The ship left Las Khoral that afternoon.

One thing impressed me greatly and that was the way the wounded took their misfortunes. I did not hear a single moan from any patient and considering the nature of some of their wounds their fortitude was wonderful. A Somali loves a fight and when hit never seems to bemoan his fate.

Two wounded captured Dervish prisoners were brought on board for further treatment. One of these cases had a septic compound fracture of the left thigh and septic bullet wounds of the right thigh. The other had a septic gunshot wound of the ankle joint with fracture of some of the tarsal bones. Both of these cases the next

... operated upon on board under a general anæsthetic all ... wounds were thoroughly ... and through and through ... established. These cases still remain on board and are progressing favourably. With regard to the septic compound fracture of the thigh a Thomas's knee splint, as advised by Robert Jones and described by him in the *British Medical Journal* of January 16, 1915, was applied in this case. This is an excellent splint giving access to the wound without disturbing the fracture or causing the patient any discomfort. It can easily be made on board in a short time by the armourer and does not require any elaborate extension apparatus.

INTRASPINAL ANALGESIA

By Lieut.-Colonel A. W. B. Livesay, M.B., F.R.C.S.I., R.A.M.C.

I adopted the intraspinal method of anæsthesia at the B.N. Hospital at the Cape immediately after the staff was reduced from three medical officers to two nine months before war broke out. Like all others who have given this method a fair trial we were so struck with its convenience and simplicity that we continued to use it when a year later the medical staff was again increased to three.

I followed the method as taught by McGavin at the London Post-graduate School of Medicine, Greenwich. The analgesic used was stovaine billon which is made up in ampoules, 1 c.c. of the solution containing equal parts of stovaine and glucose, 0·1 g. of each. The glucose is added to increase the weight of the solution, so that it flows by gravity to the most dependent part of the spinal canal when the patient is in the prone position. A special record syringe, made by Messrs. Allen and Hanbury is used. It should have half a dozen spare needles. The needles are of soft steel. The usual dose required is 6 c.g. of stovaine. The syringe is divided off so that each division equals 1 c.g. of stovaine. I have tried tropacocaine but found it not so reliable and the analgesia is shorter. On the other hand subsequent headache is rather less. The patient is prepared in the ordinary way but may have a light breakfast. The lumbar region is painted with iodine and a sterile dressing put on. The puncture is made between the second and third lumbar vertebræ or between the third and fourth—it does not matter which—both are well below the cord. The patient lies on his side, the side on which the operation is to be. If a double hernia is to be done the side uppermost should be first operated upon as analgesia will last longer on the lower side. He should be curled up until his chin nearly touches his knees and warned to keep still. It is important to see that he is lying quite square.

Now with the left forefinger of the gloved hand feel for the interval between the two spines. With the finger nail make a pressure mark in the skin just below the upper spine. We found the needle goes in more easily thus than by taking a spot midway between the two spines. McGavin says "Go neither up nor down, neither to the right nor left." We found this far the best way.

The skin is now frozen with the ethyl chloride spray and the hare lip pin is thrust in to a depth of about 1 in. This punctures the skin and makes a tract for the soft pointed needle to follow easily. Next the needle with stylet, is pushed steadily in. At a depth of from 2½ to 2¾ in. it is felt distinctly and sometimes heard to puncture the theca. On withdrawing the stylet, cerebro-spinal fluid flows.

We used to allow the fluid to flow while the syringe was being filled but later came to the conclusion that the less cerebro spinal fluid escaped the less headache there was subsequently.

The stylet, therefore, is put back, the syringe is filled and the cannula is attached with a screwing movement. Then the stylet is withdrawn, the cannula introduced and the piston steadily pushed home.

The patient is told to take two long deep breaths. Just before the end of the second one the needle, cannula and syringe are all withdrawn together. The puncture is dressed with collodion. He is now rolled over very gently on his back.

The hips are raised by a board padded with a towel to 1 in. in height or less and the head and shoulders are raised by three or four pillows. The lower dorsal region thus becomes the most dependent part of the spinal canal and the stovaine gravitates there.

A screen is rigged, shutting off the operation area from the patient's view.

Analgesia is usually complete from one minute to two minutes after the injection. If the analgesia begins the foot of the table should be raised for a few seconds and at the same time a patient should be instructed to take a deep breath. In any man under 40 it is usually very easy to get the needle into the theca provided the patient keeps still. In a very fat patient the spines are not so easily felt, and in older men there may be bony changes in the spine causing difficulty. If the needle is felt to impinge on bone it should not be pushed on, this will only turn the point of the soft needle. The needle should be withdrawn a little and then gently pushed in again slightly altering its direction upwards, to the right or to the left. If there is still failure, the patient is probably shifted his position or is not curled up enough. It is better now to withdraw the needle and start again in another space. Once cerebro spinal fluid flows analgesia in my experience never fails provided the stovaine is all right. We had a few failures due to a faulty box of ampoules. If, by the depth it is thought that the needle must be in the theca, but no cerebro spinal

fluid flows [illegible] the patient take a deep breath and hold it this may cause it to flow If it still fails to flow, withdraw the needle slightly as it may be impinging on the theca on the further side, or turn it round, as the orifice of the needle may be against the theca

McGavin says that if a dose has been injected and there is no analgesia, the stovaine cannot be in the spinal canal and the dose may be repeated, as the stovaine if not under the theca cannot do any harm We had only one complete failure to get into the spinal canal This was in a very excitable junior officer who would not keep still Analgesia extends up to the umbilicus and lasts a full hour

The following is a list of operations performed under stovaine at the R N Hospital at the Cape from November, 1913, to April, 1915 —

Circumcision	13	Removal of bone plate	1
Papillomata excised	4	Bubo	—
Cysts excised	2	Mursh arm sod	1
Varicocele	7	Fistula	3
Appendicectomy	2	Amputation toe	2
Varicose veins	18	Excision semi-lunar cartilage	1
Hæmorrhoids (ligature excision)	99	Hydrocele of cord	1
Hernia (radical cure)	27		

Disadvantages

In discussing the disadvantages of this method I may say that the only real one we experienced was headache About half the cases get more or less headache for twenty-four hours afterwards About one case in ten gets very severe headache for forty eight hours The less the patient moves while on the table and for some hours after getting back to bed the better He should be very carefully carried from the theatre and put on his back in bed with pillows under the head and shoulders Phenacetine and caffeine give some relief and an injection of morphia gr ¼ is given at night in all cases

In spite of this headache all patients we operated upon who had had a previous experience of general anæsthesia said that they greatly preferred the local method After the first few cases, men from ships on the station accepted it quite readily Patients from strange ships were apt to shy off a little at first but when put in a ward with a man who had had intraspinal analgesia there was no further difficulty In one case in which the needle must have bit off a strand of the cauda equina there were severe shooting pains down the legs for five days

McG[illegible] [illegible] of two thousand cases has [illegible] case of paralysis. About one patient in ten gets slightly [illegible] perhaps [illegible] of the operation. One [illegible] lower the [illegible] but a little brandy usually [illegible] things [illegible]. This fainting I am convinced is purely psych[illegible] surroundings, smell of antiseptics &c. I did [illegible] stovaine very early in the series and was [illegible] because the patient happened to get faint just [illegible] was being pulled upon. I did another [illegible] this occasion the patient got his fainting [illegible] peritoneum was opened. In this case there was [illegible] in locating and removing the appendix as it was [illegible] running up in the direction of the liver. The patient com[illegible] some pain when the operator's hand was above the umbilic[illegible] stood the necessary manipulation very well. A sick berth steward [illegible] told off to talk to the patient and reassure him.

Advantages

The greatest advantage is that with stovaine *two* medical officers are sufficient for all ordinary operations, and at a pinch *one* can do quite well single handed. This is a great boon in hospitals with a small staff especially nowadays when blood examinations for instance may keep one medical officer busy for the whole day.

It is economical. The dose of stovaine costs sixpence against two shillings for the average chloroform or open ether administration. This difference is greatly accentuated in warm climates. The initial cost of the syringe is thus very soon made up. In certain operations it has very definite advantages. Thus in hernia, should there be any difficulty in finding the sac, or should the presence of a second sac be suspected, by telling the patient to cough the sac is at once revealed. It is of special value in operations for hæmorrhoids, anal fissure and fistula as, owing to the perfect relaxation of the sphincter, stretching the muscle is seldom necessary. Suturing the abdominal wall is much easier than under a general anæsthetic, owing to the recti being absolutely slack. In tedious operations such as varicose veins of both legs requiring multiple excisions and double Trendelenburg, with only two medical officers available both legs can be operated upon at once, thus halving the time the patient has to be on the table.

For the service afloat under present war conditions I do not consider that spinal analgesia would be of much value. It is hardly suitable for dealing with such a rush of operation cases as may have

[illegible] injection In [illegible] that [illegible] supplied [illegible]

A medical officer single handed confronted with an operation for acute appendicitis or strangulated hernia, by using stovaine would be able to dismiss from his mind all anxiety about the anæsthetic and could concentrate the whole of his attention upon the operation

For obvious reasons no operations but those of the greatest urgency are done on board our ships in war time But in peace time there are certain operations which could very well be done on board what I may call 'quick cure' operations, those which have a comparatively short convalescence Under this heading might be included, I think, circumcision, simple cases of varicose veins varicocele fistula hæmorrhoids hammer toe &c

Large ships are now provided with operating theatres and I hope that, some day these will be used In my present ship there is a most perfectly equipped and lighted little theatre in which as regards asepsis and convenience one could tackle any operation with confidence

Under intraspinal analgesia, operations of the class I have indicated could be perfectly well performed by the ordinary medical staff and this I hold with a fourfold advantage to our Naval Medical Service In the first place it would be excellent practice for the operator who would rapidly develop technical skill and confidence Secondly, the fact of doing real surgical work on board ship even with an operation perhaps only once a fortnight would I am convinced do a great deal to promote the keenness of junior medical officers on first going to sea Thirdly, the sick berth staff on board would greatly benefit They would have wider opportunities of becoming proficient, in preparing patients for operation, in theatre routine and in the after care of operation cases This would result, I am confident, in a general increase of efficiency all round Fourthly the operating surgeons in our big hospitals would be relieved of a great amount of what is to them routine operating work and would have greater time to devote to their more serious cases There would be a considerable saving to the State not only in the time taken up in these patients going to and from hospital but also, in many cases the cost of their transit

I have to thank Fleet Surgeon A J Hewitt and Staff Surgeon G T Verry for the enthusiasm with which they took up the intraspinal method, and for the skill with which they did many of the injections

ON THE TREATMENT OF SYPHILITIC SORES WITHOUT GENERALIZED LESIONS

BY SHELDON F. DUDLEY, M.B., B.S.
Royal Naval Hospital, Chatham

There is little that is new in this paper, and the observations in it merely confirm those of more experienced observers, but being as I would be pathologist as well as a clinician, I think it presents a very real problem from a more practical point of view and summarises in a short space a large amount of modern teaching on the subject.

A sufficient excuse for writing this article is found in the one fact that at present only a quarter of the cases of syphilis in the Navy start arsenical and mercury treatment before secondary lesions appear. Since the discovery of the *Treponema pallidum* in 1905 and the application of the complement fixation reaction to syphilis by Wassermann in 1907, we can be certain of the diagnosis of syphilis without awaiting for secondary signs to develop. With the introduction of salvarsan in 1909 we obtained the means of preventing the occurrence of secondary symptoms and rendering a patient non-infectious in a few hours, neither of which could be done at all or very seldom by the use of mercury alone.

Practically all medical men now admit that the right time to begin treatment is as early as possible in the primary stage. Briefly, the reasons are: (1) The patient is more certainly and quickly cured, and the disease is less likely to recur or cause permanent injury to the constitution if it is not allowed to proceed to the generalized secondary stage during which the spirochætes have more chance of colonising. This is especially the case with regard to the central nervous system, where once established they are often impossible to eradicate and may lie dormant for years.

(2) The sooner a man receives a dose of salvarsan or its substitutes, the shorter time is he a danger of infection to his messmates or the social community at large. One injection of these arsenical compounds causes complete disappearance of the treponemata from the lesions in a few hours. I have never been able to find spirochætes (in sores which previously swarmed with them) on the day following an injection of galyl or neosalvarsan. The lesions therefore no longer contain the wherewithal to spread infection, and I believe this not only because of one's inability even to

and specific [illegible] injection but also because in nearly all cases the [illegible] to heal and the man gets apparently cured by one dose [illegible]. It was for this reason that at first after the introduction of salvarsan it was thought that one injection absolutely cured syphilis. Unfortunately in most cases a few organisms apparently survive and remain inactive for varying lengths of time so no reliance can be placed on one or two doses of these salvarsan compounds causing a permanent cure. A case that illustrates this is that of a man who had primary syphilis to whom I gave one injection of neosalvarsan in April 1915 by some means or other he escaped all further treatment going through the Cameroons campaign remaining free from all signs of the disease until August, 1916 when he developed a syphilitic ulcerated throat, and reappeared at Chatham hospital for treatment.

(3) From the Service point of view, if men are treated before secondary signs show themselves many days' sickness are saved, and sounder and fitter men preserved for the Navy. In 1913 there were 719 primary cases and 2,134 secondary cases of syphilis in the Navy; the primary cases averaged 21·7 days sickness each and the secondary ones 34·3 days roughly 10 days more than a primary case. It may be justly concluded on these figures that if the secondary cases had been diagnosed and treated with salvarsan or its substitutes in the primary stage even under the existing routine 21,330 days would have been saved the Service, as these drugs invariably abort the secondary stage. Personally I believe a primary case is much better for carrying on full duty, and also if he has galyl I believe it necessary to retain him on the list for the day of injection only: thus with three galyl injections the ordinary case of syphilis under ideal conditions would only be 3 days sick instead of 30 or more as at present. And in addition for reasons given above there would be no need to segregate him as once having had his galyl injection he is no longer a source of danger to others.

In spite of the fact that these views are now almost universally accepted in 1913 only 24·8 per cent of syphilis cases started treatment in the primary stage and during the quarter April to July 1916 only 26·5 per cent of 302 fresh cases of syphilis admitted to Chatham hospital were without secondary lesions. What is the reason for this low percentage of primary cases treated? Many men, of course, conceal venereal disease till the secondary symptoms are evident, and this at present is especially common with the Reserve and Temporary ratings now in the Service. These latter now

proved [illegible] with the syphilis [illegible] treated at this hospital (402 out of 702 cases admitted recently were of this class) but I do not think concealment accounts for most of the cases which get past the primary stage The waiting for secondary signs to appear was the universal teaching till latter years the disease thus diagnosed itself and saved the doctors trouble This custom dies hard and is responsible for a lot of secondary cases which might have been treated earlier It is an especially pernicious doctrine as it may happen that the secondary signs do not appear at all or not for years, and thus cases may get no antisyphilitic treatment of any kind till it is too late In most places it is still routine to wrap up every sore in lobo nigra or antiseptic before diagnosis is confirmed, thus minimizing the chance of finding spirochætes and of proving a sore syphilitic at the ideal time to start treatment, that is before the Wassermann reaction becomes positive It also accounts for the terribly common history of a man being discharged as a cured "chancroid" and returning a week or two later as a "syphilis secondary"

It was the great discrepancy between practice and theory that led me, last November to wonder if laboratory methods were as much use as one thought as an aid to diagnosis Since then every venereal sore that could be got hold of was examined, both for *T. pallidum* and by Wassermann's reaction The majority of sores were only examined once and the search for spirochætes was generally hurried as a minute or so of time was all that could be given to a slide Though I have found the spirochætes of syphilis in lesions in which they were not numerous after half an hour's search usually, if present, they are easy to find In addition most of the sores had had some antiseptic treatment before examination though by the courtesy of medical officers in the port they were nearly always put on saline dressings on arrival in Chatham yet under anything but ideal conditions the investigations showed that nearly all syphilitic sores could be definitely proved to be such, either by finding spirochætes or by the Wassermann test Some of the cases were examined two or more times, but only first examinations are included in this first table of statistics Altogether the venereal sores of 671 men who had no signs of secondary syphilis or history of previous syphilis, were examined 426 or 63·42 per cent of these were at once proved to be syphilitic by one or other test the remaining 245 gave a negative result to both tests The first thing to do is to try and see how many of these 245 were probably syphilitic, 115 of

[redacted] negatives were examined up to [redacted] 15 1916 all [redacted] [redacted] at least to have elapsed for the development of secondary symptoms On the date of writing August 10 1916 16 of these 11 or 13 9 per cent, have been proved to be syphilis either by subsequent tests or the appearance of generalized lesions I do not think many more than this were syphilis as cases of venereal disease remain in the port until cured and anyhow were nearly certain to have drifted back to hospital for treatment even if symptoms had developed after drafting still to be well on the safe side call the 13 9 per cent 20 per cent Therefore of the total 242 cases to give a double negative on the first examination presumably less than 20 per cent, that is, 49 were syphilitic therefore out of the 671 cases, 126 were certainly syphilis, 49 probably syphilis and 196 probably chancroid

Before going further it is as well to point out this is no evidence of the relative prevalence of the two diseases

The Annual Statistical Report of the Health of the Navy shows the ratio of chancroid to syphilis to be about 2 to 3 The reason that syphilis preponderates to such an extent in these figures is probably because cases suspected to be syphilis are sent from many places to Chatham for arsenical treatment while those thought to be chancroids are treated locally

The results of the first examinations of these 471 cases considered to be primary syphilis may be divided thus —

		Number	Per cent
Class A	Spirochætes found, but Wassermann negative	135	28 6
B	" and positive	179	37 9
C	" not seen	151	31 8
D	Both tests negative (but probably syphilis)	49	10 4
		476	100 0

Therefore by means of either test alone one can be certain of over half the syphilitic sores and with the use of both tests 90 per cent of primary sores reveal their nature Of the remaining 10 per cent, nearly all could be proved syphilis, before secondary symptoms appeared if repeated examinations are carried out It is in the early days of the primary lesion when the Wassermann reaction is generally negative that the *T pallidum* is most easily found and this is the ideal time to start treatment before the blood reaction appears The reason why they are easy to demonstrate in sores of short duration is twofold first the case is less likely to have had much local treatment secondly all syphilitic lesions tend towards local cure

[illegible] a sore will heal up without treatment before [illegible] appear owing to the establishment of a local tissue immunity to the treponema; therefore in late sores, the spirochaetes may have disappeared before the time of examination.

In most cases a note was kept of the date of infection and appearance of the sore. These dates are not very trustworthy as they depend on the word and memory of the patient, and the men treated have often a very vague idea of time; also however truthful a man is ordinarily, he will for no obvious reason lie about his venereal disease. For example over and over again men deny sexual intercourse at all, and numbers will say that a given date of infection, which seems unlikely to be the right one, is the only time they had ever had connection, a statement too common to be always true. Again a man will frequently say a rash or bubo appeared before the penile sore; occasionally he may think he is telling the truth, as the more noticeable late conditions may have attracted his attention to an insignificant primary lesion. Men too almost invariably tend to give a shorter duration than the actual, to avoid being blamed for concealing disease. Still, in spite of these sources of error, a study of the duration and incubation periods of these cases gives some interesting results. 200 men of the syphilis group in which a note was kept gave a more or less definite date of infection and appearance of the sore; from these dates this table is compiled :—

TABLE I

Duration of sore	Totals	Spirochaetes positive	Wassermann positive	Percentage spirochaetes positive	Percentage Wassermann positive
Under 10 days	77	62	33	80.5	42.8
Between 10 and 20 days	60	42	32	68.7	[illegible]
" 20 " 30 "	23	17	20	[illegible]	86.9
" 30 " 40 "	25	8	24	[illegible]	96.0
Over 40 days	15	8	15	53.3	100.0
Totals	200	135	144	[illegible]	[illegible]

The correlation of the two tests, showing that if one is negative the other is likely to be positive, is well shown by the table, but a diagram compiled from the percentages in the table shows this more forcibly still.

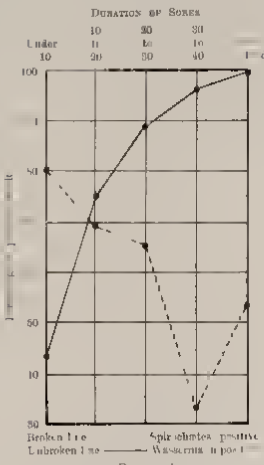


Diagram 1

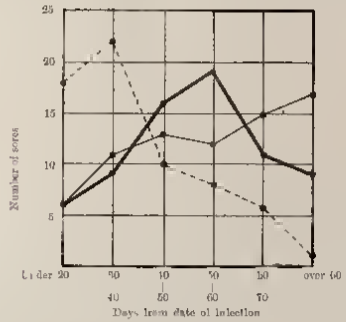
It will be seen that the percentages of sores with demonstrable spirochætes drop steadily till the oldest sores of over forty days' duration is reached when it rises again This rise may be only a chance owing to luck in finding spirochætes more often than would have been the case if a larger number of sores of this class had been examined There is another possible explanation the average duration of the primary stage is forty two days, so one would not expect to many pure syphilitic infections (without secondary signs) as fifteen in the over forty days group It was noticed that many of these sores of long duration gave short incubation periods therefore it is quite possible they were mixed infections and the real duration of the syphilitic element may have been nearer twenty than forty days

In the next diagram based on the date of infection instead of

appearance, it will be seen this terminal rise does not occur in the spirochæte line, as the error introduced by mixed infections cannot come in. For this reason and because men have less cause to be about at the date of contracting the sore is perhaps more reliable so another table and diagram is shown of the same 209 cases this time dividing them into three classes (1) Both tests positive; (2) spirochætes only (3) Wassermann only positive the time being reckoned from the date of infection

TABLE II

Time from date of contracting to examination	Wassermann and spirochæte positive	Spirochætes only positive	Wassermann only positive	Total
Under 20 days	6	18	1	25
20 to 30 days	9	22	11	42
30 „ 40 „	16	10	11	37
40 „ 50 „	19	8	13	39
50 „ 60 „	11	6	15	32
Over 60 days	9	1	13	27
Totals	70	65	74	209



Thick line ——— Both Spirochætes and Wassermann positive
Thin line Wassermann only positive
Broken line Spirochætes only positive

DIAGRAM 2

It w[illegible]n the totals of sores in each [illegible] period d[illegible] not vary much, so in making the diagram [illegible] unnecessary to reduce the numbers to percentu[illegible] would be easier to understand if the figures wo[illegible] as they stand

Before leaving these statistics it is as well t[illegible] they agree with those of other observers In Table I the figures of positive Wassermann reactions at various times in the primary stage are all a little too high in that the actual duration of the sore is nearly always longer than the admitted duration in the class of case treated in the Navy, also I have made no allowance for the double negatives The number of primary cases to give a positive Wassermann reaction varies greatly in different reports because it depends entirely whether the majority of reactions were done late or early in the primary stage Therefore, the percentages of positive reactions in primary syphilis are of little value unless the age of the lesions is stated Citing one of the latest observers to publish his results gives 34 per cent positive at end of the first week, 57 per cent at end of second week and 76 per cent at end of fourth week His figures for secondary syphilis are 96 per cent positive Fleet Surgeon Bassett-Smith's figures 93 per cent, and my own on the secondary cases I examined and treated myself 90 5 per cent positive These figures balance pretty well with mine The antigen used at Chatham was perhaps less sensitive than theirs Until three months ago guinea-pigs heart and cholesterine were used Now human heart replaces the guinea pig and is more satisfactory and experimentally more sensitive than the older antigen Also, owing to receiving all sorts and conditions of blood from all over the country most of them unaccompanied by any data concerning the case they have been taken from I never return a reaction as positive unless hæmolysis is absolutely inhibited, or negative unless hæmolysis is complete and if hæmolysis is incomplete it is wiser to return the reaction doubtful, avoiding such terms as 'weak positive, and probably negative The reaction is a quantitative one therefore such terms mean little, and after all only cover 2 or 3 per cent of reactions which are not clean cut positives or negatives (These remarks are based on an experience of over 10 000 tests personally performed at Chatham)

If we turn now to the sixteen sores that were not proved syphilitic till after the first examination and tabulate them one is able to get an idea why some of them were missed

TABLE III

CASES GIVEN A NEGATIVE TO ROUTINE TESTS ON FIRST EXAMINATION

Case	Date of patient's examination	Incubation	Duration	Number of sores	Treatment	Examined next	Has proved syphilis		Date proved syphilitic
1	28 12 15	?	?	Circumcision wound	Lot. nigra	No	Secondary rash	Wassermann positive	10 1 16
2	28 11 15	11	21	Single	[illegible]	[illegible]	Secondary rash	Wassermann positive	11 12 15
3	[illegible] 16	12	11	?	Saline	[illegible]	Secondary rash	Wassermann positive	16 3 16
4	1 3 16	8	21	?	Lot. nigra		Secondary rash	Wassermann positive	17 4 16
5	[illegible] 1	6	10	Multiple		Yes	Secondary rash	Wassermann positive	11 4 16
6	[illegible] 16	34	5	Single		16 3 16	Yes	Secondary rash and Wassermann always negative	10 6 16
7	[illegible] 1	14	5	Multiple	Iodoform		7 to 9 days	present positive	16 3 16
8	[illegible] 11	[illegible]	16		Saline				15 3 16
9	[illegible] 16	3	11	Single	Lot. nigra	[illegible]	[illegible]	[illegible]	27 4 16
10	[illegible] 11	11	8	Multiple	[illegible]	[illegible]	[illegible]	[illegible]	26 4 16
11	[illegible] 11	14	11		Saline		Wassermann positive		10 5 16
12	[illegible] 11	8	14		Lot. nigra				7 2 16
13	19 4 16	18	9		Exposed to infection in April. Wassermann positive. No secondary signs				19 5 16
14	[illegible] 11	4	2	Multiple	Saline	Yes	Wassermann positive		12 6 16
15	[illegible] 11	[illegible]	7		Lot. nigra				12 6 16
16	11 11	[illegible]	4		saline	[illegible]	[illegible]	[illegible]	3 7 16

On looking through the table it will be seen that only six got as far as the secondary stage, and only two of these cases 5 and 6 were examined again before secondary signs developed. The remaining ten were proved to be syphilis, four by finding spirochætes and six by the Wassermann reaction before generalized signs appeared. It will be seen that most cases had had local antiseptic treatment, which minimizes the chance of a successful spirochæte examination, though they have been demonstrated in sores which have been weeks on lotio nigra. Case 10 is an example of a sore which had been treated with lotio nigra up till the time of the negative first examination; on substituting saline dressings, spirochætes were found at a later examination. It must be always kept in mind that a sore may not be syphilitic at the time of examination, chancroid and syphilis being caught at the same time until the sore being examined at a time before the syphilitic virus has incubated. Cases 5 and 16, were perhaps of this class. This class of mixed infections seems to be very common both from appearance of some sores, and the number of short incubation periods given by

[illegible] syphilis 18 2 per cent of the [illegible] of under ten days The [illegible] 209 was 21 9 days Twenty-[illegible] incubation period of syphilis [illegible] tend to run than it seem shorter and the tendency [illegible] post date the appearance of the chancre tends to [illegible] longer than the actual period (N B —Ratings giving two possible incubation periods are not included amongst these 209 cases) Case 6 is an example of a case where the Wassermann remained permanently negative and no treponemata could be found The sore of Case 13 healed up, he exposed himself to infection again so it is a matter of doubt if he was syphilitic at all at the time of the first examination

I have been told that spirochætes mysteriously appear and disappear from syphilitic lesions from day to day which may be another possible cause of missed sores I have no evidence of this and think it must be exceptional in early untreated sores, but as explained above they tend to die out from old sores and one may get a stage where they can sometimes be found and at other times cannot but by this time the Wassermann reaction should have become positive in most cases

This investigation brought out very strongly how impossible it is to diagnose most primary sores from their appearance Text books lead one to put great faith in induration also they give one the impression that the syphilitic primary lesion is rarely multiple If a sore shows cartilage like induration it almost always proves to be syphilitic, but early sores more often than not show no induration The typical Hunterian chancre and a pure Ducrey bacillus infection are characteristic, unfortunately the vast majority of sores are not typical nor are they pure infections This is due chiefly to an invariable contamination with pyogenic and other organisms It is seldom, therefore that one can say with any certainty that a sore is a chancroid or a case of primary syphilis without having recourse to laboratory methods For some time a note was made as to which infection the case was thought to be before the result of the spirochæte or Wassermann examination was known this note was so often wrong that I soon decided it was a mere guess in most cases

As regards the number of sores in each case, this was noted in 148 cases of undoubted syphilis and in 228 cases considered to have chancroide only 14 or 17 6 per cent, of the syphilis cases had two or more sores, and 122, or 53 2 per cent., of the chancroid cases

had two [illegible] sores. Hunter the tendency [illegible] multiple [illegible] greater than that of syphilis [illegible] if not the slightest risk in diagnosis over one third of the syphilitic chancres being multiple.

The position of the lesion on the genitals shows some relation but very little, to the kind of infection. sores on the skin especially towards the root of the penis or on the scrotum and also those which involve the meatus, are generally found to be syphilitic. The favourite site of election for chancroid seems to be the mucous surface of the prepuce. Whilst discussing position it does not seem out of place to make a short digression on extra genital sores. Hard induration is not characteristic of those I have seen, but painless oedema with painless enlargement of a neighbouring lymph gland is two or three have been diagnosed at Chatham before the onset of generalized symptoms. A septic place in a healthy blue jacket that will not respond to ordinary treatment is always worth a spirochete and a Wassermann test the following case illustrates this.

In 1907 a boy came to the sick bay of H.M.S. Donegal with a septic bubo too which could not be persuaded to heal. A diagnosis of syphilis was not dreamed of. Six weeks later he developed marked general lymphadenitis and a typical secondary rash. With our present day knowledge a spirochaete search or a Wassermann reaction would very likely have been made, and the real nature of the condition discovered before the appearance of the rash.

Extra genital sores in the neighbourhood of the genitals are not uncommon—I have seen them on the scrotum, lower abdomen, umbilicus, and thighs. These parts are likely to get contaminated by the infectious discharges of the woman, and the man could easily inoculate himself by scratching a scabies papule or in a like manner. A thought here strikes one very forcibly men are sometimes accused of unnatural practices on the evidence of syphilitic infection in the region of the anus itching in that neighbourhood is common but how easy for a man innocent of criminal offence to infect himself in this region in the way just suggested anal ulceration therefore appears very unreliable evidence in these cases.

The preceding paragraphs show how impossible it often is to be certain of the diagnosis of syphilis in the primary stage without having recourse to laboratory methods. Any lesion on the penis may be a primary sore, and I am convinced in some cases a sore may not exist at all. I have seen one or two cases of syphilis with a hard painless nodule in the course of the dorsal lymphatics of the

penis over which the skin [illegible] showed no signs of inflammation and other [illegible] with indurated inguinal glands In these cases there [illegible] a sore and no signs of a scar that might have been [illegible] Dubuisson suggests the following explanation that [illegible] lesions owing to the tissue resistance on some other [illegible] develop at the site of entry but some of the spirochetes [illegible] and get as far as the lymphatics where they begin growing to form the initial focus The French have recognized this form of primary syphilis for a long time but it has not attracted much attention in this country I think however every one admits the secondary symptoms may be so mild as to escape attention what if both stages pass unnoticed more frequently than is generally believed? If so does it not offer a more plausible explanation, for the many cases of late syphilis and para syphilis that give no history, than the assumption that all these men are liars or have such appallingly bad memories That the lack of history is generally due to the wilful falsehood or bad memory is admitted but there are patients who readily confess the risk of infection or to have had gonorrhœa and who obviously seem to be doing their best to remember anything that might have been early syphilitic manifestations A reasonable solution to the lack of history in these cases is offered by this absence or insignificance of both the primary and secondary stages

Two or three conditions that lead to diagnostic errors should just be mentioned one is the tendency of late lesions to occur at the site of the primary lesion this fact alone explaining many of the so called second infections with syphilis other sources of error very common in the Navy and non venereal in nature are herpes scabies, and inflamed small sebaceous follicles Herpes unless seen early, is often very difficult to distinguish from soft sores, while scabies may deceive one by having its only obvious lesions on the penis

If this paper seems to extol laboratory methods at the expense of clinical observation a word of warning is necessary negative laboratory results should invariably be ignored in syphilis, as well as all other conditions if the clinical side of the case does not fit in with them Positive results if obtained with reasonable care are generally sufficient diagnostic evidence in themselves Secondary and tertiary lesions are generally pretty obvious clinically and the Wassermann a useful confirmatory sign which is better ignored if negative Early primary syphilis is seldom obvious clinically and here if we can get a positive laboratory result it is of the utmost

importance in arriving at a diagnosis of syphilis. The finding of the treponemata in serum from the sores is the most successful method in the first half of the primary stage, a positive Wassermann reaction in the latter half of primary and in latent syphilis, while clinical observation is the best diagnostic method in all other stages. Even in the primary stage, if the case is clinically syphilis, in spite of repeated negative laboratory results it should be treated as such. Syphilis and Wassermann are not synonymous terms though some use them as if they were. The following case shows what is meant. —

A man, aged about 20, was admitted to hospital in November, 1915. He had been infected in March and circumcised in April 1915. A large necrosed penile sore, the size of a florin with heaped up edges was present. Presumably because his Wassermann reaction had been fifteen times negative and several spirochaete examinations also negative, malignant disease was actually suggested as a diagnosis. He apparently had had no anti-syphilitic treatment in the eight months previous to admission to hospital and no secondary signs. The tests repeated at Chatham were negative but the sore healed up within a month of receiving a galyl injection. Incidentally, response to treatment is a well recognized though lately very neglected form of diagnosis since laboratory methods took its place.

Personally I am not certain, if one is in any doubt about the nature of a penile sore, whether it is not better to commence treatment rather than let a man run the risk of the awful consequences of infecting his central nervous system by waiting to confirm a diagnosis by generalized signs.

The question arises—is there any remedy for the small number of cases in the Navy treated in the primary stage? To repeat the chief causes, they are in their probable order of importance. (1) Not making full use of laboratory methods. (2) Concealment of disease for part or whole of the primary stage. (3) Delay and difficulties of getting cases to institutions where they can get intravenous injections of arsenical drugs. (4) The loss of time in the return of laboratory reports. If a case is seen directly the primary lesion appears there is an average of forty-two days available to make a diagnosis and start treatment, but of course a man may be seen so late in the primary stage that the time that has to elapse before confirming the diagnosis and getting him to hospital may be too long to save him from secondary symptoms.

To take full advantage of laboratory methods the following procedure is suggested. (1) Sores unless the local condition absolutely demands more energetic treatment should be dressed only with normal saline solution or warm water, and receive no antiseptic

[illegible] decided [illegible] (1) [illegible] and if [illegible] weekly [illegible] healed or diagnosis [illegible] (3) Blood should [illegible] for a Wassermann [illegible] till positive or till the sore is healed. (A negative Wassermann during the first three weeks of the sore means nothing—and it would be wise if the sore heals to repeat the test again a month later.) (4) Ignore laboratory negatives if clinically everything points to syphilis. *The spirochæte examinations if possible should be made on board ship or man's place of duty. Dark-ground illumination is by far the easiest quickest and most reliable method of demonstration, far better than any staining reactions and it would be well worth while fitting a special lamp and dark-ground condenser to the "service" microscope outfit.*

Some medical men loathe the microscopic methods, for them except for delay in return of the report there is no reason why serum from a syphilitic lesion should not be sent in capillary tubes to the nearest laboratory. Improvements will remain recognizable for two or three days after exhibition. The report on a blood sample for Wassermann may take ten days to obtain from the time of seeing the case because (unknown to Chatham) it is only possible to do blood tests once a week the time taken in preparing and standardizing the materials necessary being considerable, and it takes as long to prepare for one test as for the 150 that are made. This might possibly be arranged for by having different days at different laboratories and by sending the blood to the laboratory whose day for doing the tests best suited with the arrival of the patient's blood by post. In this way a report might be obtained four days to a week earlier. The waiting for opportunities to send a man ashore for an intravenous injection and even then the waiting for vacancies at times of rush at the hospital is a cause of very considerable delay. *The easiest remedy for this would be the giving of arsenical drugs afloat.* In galyl we have as far as can be seen an almost harmless drug with antisyphilitic properties, nearly if not quite as good as salvarsan, it is easy and simple to give, and if ever it is found practicable to give intravenous injections in a ship, it is the ideal drug for the purpose. (Nearly 1 000 injections of galyl have been given at Chatham without a case giving any cause for anxiety, and the dose in no case, except two or three at the start of its introduction, was less than 0·4 gramme.) The most difficult cause of the small number of primary cases of syphilis in the Navy to deal

[illegible] is concealment [illegible] At present [illegible] is not so prevalent amongst all [illegible] amongst reservists especially trawler ratings, who are not probably as used to, and have not had the opportunity to bring their ailments to a doctor, or as well educated in the importance of reporting early when sick as the regular ratings. To combat concealment, I am certain punishment is of little use laying great stress in hygiene lectures on the importance of early treatment from the man's own point of view, how he has a better chance of permanent cure and less time on the sick list may have some effect. Men should also be told how the most experienced doctor let alone a quack chemist or a messmate, is often unable to say any penile lesion is not syphilis this is necessary as there is a lot of quack practice in venereal disease in our big seaport towns. There is room also for more humanity and consideration for venereal patients in the Navy one cannot help hearing many expressions of contempt and disgust concerning these unfortunates from people who have either been only lucky in escaping the disease themselves, or possessing the advantages of a better education and higher principles should surely have more pity for those who have not had these advantages. No one knows better than the unfortunate man himself the moral stigma attaching to the syphilitic whereas rarely (why, I have never understood) is there any attached to the man who has risked it but been lucky enough not to get infected. The only hope of lessening concealment is education for the men before, and consideration for them after contracting disease. To summarize this paper tends to show —

(1) Only a quarter of cases of syphilis in the Service start intensive treatment in the primary stage.

(2) That if seen in the primary stage over 90 per cent of primary cases are definitely diagnosable as syphilis.

(3) The proportion of primary cases to start treatment might be increased by further use of laboratory methods and by doing everything possible to encourage men to report early.

(4) The advantages that would be gained are thousands less of sick days, and sounder men saved to the Navy, by treatment with arsenical drugs on board time, paper work and transport would be economized, and many beds in hospitals would be released for other cases. And what to my mind is more important than any of the above, a man would be rendered non infectious sooner and be for less time a danger of infection to the community at large thus reducing if only to a small extent, the actual incidence of

syphilis in the Service and the whole country Men would be treated at [illegible] when there is the best chance of preventing recurrence [illegible] in the central nervous system It is here that the [illegible] so difficult to eradicate having once colonised, and [illegible] immunologists agree that it is most likely during the secondary [illegible] stage of syphilis that the seeds of future general paralysis [illegible] tabes or ataxy are laid Therefore treatment in the primary stage seems our only hope of diminishing these scourges as there is little evidence that any amount of treatment later prevents their appearance In addition what is of especial importance at the present time, the birth rate would increase infant mortality decrease, and more and healthier children be bred for the nation

In conclusion, though the State cannot see its way to devise or introduce legislation to prevent syphilis in the community at large, yet in the Service the idealist can see the dawn of the day when all cases are diagnosed and start intensive treatment in the primary stage, no man is more than three days sick, and secondary syphilis a rare and strange condition almost unknown in the Royal Navy But even if the complete realization of this vision is impossible I hope anyone who has read through this paper will admit there is still a little room for improvement in the routine, control and treatment of syphilis in the Royal Navy

ADDENDA

The above paper was written in August 1916 except for bringing some of the figures in it up to date (November 1916) there is no need to alter any statements in it The following observations were made since the paper was written and are added to make it more complete

Two actual cases have been seen which show that the *Treponema pallidum* is often present in the early primary stage, while the Wassermann reaction is still negative, and that the treponemata have often disappeared by the time the Wassermann is positive

Case 1.—Two insignificant penile sores contracted seventeen days previously had been present for three days, Wassermann negative treponemata numerous Re-examined twenty-eight days later Wassermann positive no spirochætes found in the almost healed sores which had only been treated with saline dressings

Case 2.—Sore present for fifteen days Wassermann negative *T. pallidum* found sixteen days later no spirochætes could be seen but Wassermann was positive

These two cases are the only two of this description I have records of as once diagnosed by either test a man should start treatment But owing to a report going astray or to some other error these cases were obtained. The following figures collected during last quarter compare,

very roughly the delay in reporting disease with the delay in diagnosis and transport, as a sense of men developing generalized syphilis before receiving arsenical injections

In ninety-two unselected cases of early secondary syphilis a note was made of the time that elapsed between a man reporting to a naval medical officer and his appearance in hospital for arsenical injections The average number of days per case was 50 1 That is the average case of secondary syphilis had been under observation over seven weeks before he got an intravenous injection Allowing three weeks as the maximum time required for diagnosis and transport, it was found 57 6 per cent of these cases had been under observation over three weeks before getting an arsenical injection

In seventy secondary cases where a possible date of contracting the disease was given the number of days between this date and the date of reporting the disease was noted Sixty seven days is the average time that elapses between infection and the appearance of secondary signs, so if the above number is under sixty seven the man probably reported himself during the primary stage In 71 7 per cent of these cases this was the case If twenty one days (the maximum time allowed for diagnosis and transport) is taken from the number sixty seven we get forty six days so if a man reports within forty-six days of infection there should be plenty of time to diagnose and treat him before secondary signs appear this was the case in 51 4 per cent of these secondary cases These figures require no comment but it may be remarked in very few of these cases had any attempt been made at laboratory diagnosis during the primary stage

Many of the cases that had definitely arrived at the secondary stage before reporting sick admitted being treated privately ashore by a chemist or quack

I would like to make it quite clear that galyl or neosalvarsan given however late in the primary stage, almost invariably prevent the onset of generalized syphilis This power to abort the secondary stage is their most valuable property and is where they are especially superior to mercury alone All cases should of course have in addition at least two years intermittent treatment After the primary stage has passed, in the vast majority of cases as good results if not as rapid, can probably be obtained with mercury alone

This paper is largely statistical I wish to anticipate the obvious platitude that statistics can be made to prove anything Because if anyone thinks a moment he will realize that all the so called "facts" of medical science are founded on statistics compiled from large numbers of cases If the figures used in this paper have been wrongly applied or important factors not allowed for I will be grateful to anyone who will point out the errors

A REVIEW OF THE TREATMENT OF ACUTE GONORRHŒA

BY SURGEON G. B. PAGE, M.B., R.N.

The purpose of this paper is intended to be an account of the various methods at present in disposal for the treatment of acute gonorrhœa. Most medical officers will agree that this disease is very frequent in the Royal Navy as anywhere else but at the same time it is useful to review the position of affairs so far as present. Without then presuming to add to anyone's knowledge I will endeavour to discuss the principal methods of the day.

Permanganate irrigations or injections have come to be regarded as the most efficient routine treatment in the Royal Navy and nothing is likely to replace it for the time being, unless perhaps the ever increasing price of permanganate and possible scarcity. The exact procedure differs in the various ships and establishments. Irrigation thrice daily with a pint of warm 1 in 4000 solution at a pressure of about 7 ft. from the ground is quite satisfactory. While it is true that other methods of local treatment are used in special cases these cannot be said to have gained a firm footing in naval practice.

Local treatment falls under two headings —

(1) The application of antiseptics.

(2) Artificial congestion.

I will deal with congestion first. This is obtained by means of Klapp's suction bell which is applied intermittently over a period of one hour daily. 'This apparatus has given good results in some large institutions, such as the Royal Infirmary, Edinburgh.' 'In recent gonorrhœa the discharge rapidly diminishes, and there is a remarkable absence of complications.'[1] This procedure is never likely to come into general use as it needs constant skilled supervision and moreover the apparatus is fragile to say nothing of being German made and therefore unobtainable at present.

Of the antiseptics suitable for injection the salts of silver rank after permanganate of potash on account of their special action on the gonococcus. They are nitrate of silver and its organic compounds (protargol, albargin, largin, &c.). Last year I used silver nitrate in the following way with considerable success, my intention being to attack the gonococcus first with silver, and later to

[1] Thomson and Miles. Manual of Surgery. Fourth Edition, vol. i. p. 747.

eliminate other organisms [illegible] discharge with [illegible] irrigations daily of 1 5000 nitrate of silver Each irrigation consists of one pint of fluid as hot as can be borne given by means of an ordinary douche can and tube, the tube ending in a medium sized Mauoch tube The douche-can should be suspended 4 ft above the patient's abdomen The patient having passed water holds the penis as far back as possible with the left hand and applies the irrigation tube with the right hand If it is thought that the fluid is not passing properly down the urethra partial occlusion of the outlet limb of the urethral tube by the patient s forefinger will increase the pressure sufficiently The tubes are kept in 1 1,000 perchloride or other antiseptic lotion and rinsed in water before and after use In an uncomplicated case little or no discharge will be seen on the eighth day and on the tenth the silver is stopped Permanganate is now substituted (1 5,000) and kept up for four or five days when the patient should be clear of disease This mode of treatment has given very satisfactory results especially in cases treated early The discharge ceases in twelve to twenty days

It is to be noted that injection of any compound of silver may cause the discharge to become thicker during the first twenty four hours , patients should be warned of this

Irrigation is very much to be preferred in the Service to syringing as it is cleaner and more efficient As regards efficiency a surprise visit at injection time to any large venereal department where syringes are used will demonstrate the point The perfunctory squirting which some patients indulge in when not under the doctor s eye is quite useless though often due to ignorance and laziness, rather than to a desire to prolong the disease

Protargol may be taken as typical of the organic compounds of silver It is soluble in water the solution being most conveniently made by adding cold water little by little and stirring in a mortar For irrigation purposes it has no advantages over the nitrate and is much more expensive Under certain circumstances such as when a patient can only attend once a day it is very useful as an injection The solution which may be gradually increased from 1 to 4 per cent should be freshly prepared with cold water The patient having passed water sufficient is injected with a *large* glass syringe to distend the urethra by pressure after which the patient grasps the glans penis to retain the fluid At the end of ten minutes the fluid is allowed to escape and should do so with a decided spurt Distension of the urethra is absolutely necessary to success and for this

reason the ½ oz syringe ordinarily supplied is no use The average urethra holds more than 4 drachms often 6 sometimes more The first few injections are always painful and one may have to start with ½ per cent. solution This method has proved most successful in my hands when administered personally, probably because sick berth stewards fail to get the proper distension or do not make the patient retain the solution long enough There is no reason why this treatment should not be intrusted to an intelligent patient The outfit is very small and it is easy to imagine circumstances where the method would be most convenient

Albargin, which is favoured in some civil lock hospitals, is used in weaker solutions and appears to be more powerful than the other organic compounds of silver Nargol is used as a prophylactic in the Navy

Other substances used for urethral injection are Zinc sulphate chloride, sulphocarbolate and permanganate lead acetate bismuth subnitrate alum, ferrous sulphate sodium sulphocarbolate and biborate (borax), boric acid and tannic acid

It will be noticed that most of the substances in this list are astringent rather than antiseptic and have little place in the treatment of acute gonorrhœa whatever their value may be in gleet The salts of zinc however are important and frequently used Permanganate of zinc is a powerful antiseptic and astringent probably much more so than the potash salt, but more expensive It is used in exactly the same way The sulphocarbolate is freely soluble in water It is inferior to silver or the permanganates

I have never heard of anyone injecting solutions of formaldehyde into the urethra but it is worth while remembering that very small quantities are strongly germicidal

The irrigation method sometimes known as Janet's, in which weak permanganate is permitted to enter the bladder (1 6 000 or 8,000), has not found favour in the Navy Its use in acute anterior urethritis is open to obvious theoretical objections which however do not seem to be realized in actual practice I believe it is used in some military hospitals and on the Continent, where it is said to be especially valuable in obstinate cases

There are few parts of the body that the medical electrician has not attacked and no review of the treatment of acute gonorrhœa would be complete without a reference to the electrolytic method

The treatment is carried out by inserting a perforated platinized canula filled with a solution of sodium iodide (2 per cent.) and

iodine (0·1 per cent.). A platinum wire is passed down the cannula and connected with the positive pole of the battery. A very weak current is passed for a definite period and then reversed for the same period. The method is still *sub judice*. Having no experience of it I will quote a recently published paper[1]. "There is no doubt that the treatment rapidly reduces the discharge and practically none is visible at the meatus in from eight to fifteen days. Our experience, however, up to the present is that the gonococcus is still to be found in the smear taken from the meatus first thing in the morning after the all night non-urination."

The introduction of the cannula requires great care and patience in the highly sensitive urethra of acute gonorrhœa, even after a previous injection of cocaine down the canal.

Since attention to detail is the secret of success in treating gonorrhœa, one may be permitted to mention a few general points. The question often arises whether patients should be up or not. In private practice this is often desirable; but in the Service medical officers naturally object to crowding the sick bay and increasing the number of days sickness in the returns. A great deal can be done by insisting that patients wear close fitting bathing drawers to support the penis and testicles; also penis bags with frequently changed antiseptic wool whenever the discharge is copious.

Severe cases must be put to bed, and in the tropics all benefit by a few days' rest and low diet.

Patients are always warned about the infectivity of the discharge, but not always given the opportunity to observe the caution. Every venereal department should be provided with swabs moistened in antiseptic with which the patient cleanses the foreskin and glans before injection, and also a bowl of antiseptic for rinsing the hands afterwards.

The importance of avoiding alcohol is generally recognized and in the Service afloat this is easily enforced, but difficulties may arise in large shore establishments where beer is obtainable at the canteen. One cannot overestimate the value of an initial purge and the subsequent regulation of the bowels by saline.

Finally I must refer to certain adjuvants—diluents, diuretics and disinfectants.

Milk and barley water are such excellent diuretics and diluents that drugs seem unnecessary. The mixture known as "mist. alkali

[1] Major Fiennes, R.A.M.C., the *Practitioner*, vol. xcvi. p. 400.

(consisting of tincture of hyoscyamus, potassium nitrate and alkaline bicarbonate) is often given in gonorrhœa. While useful in other urinary conditions such as gravel, hyperacidity, &c., its use in gonorrhœa is to be condemned on the ground that anything which markedly diminishes the acidity of the urine assists the growth of the gonococcus.

It would be better to give hyoscyamus in a neutral mixture. Local pain and spasm, however usually yield to rest, hot baths and hot applications.

The common urinary disinfectants are Hexamine, copaiba, sandalwood oil and cubebs.

Hexamine (official B.P. 1914) is one of the best urinary disinfectants we possess. It is also diuretic. It is antiseptic because in the presence of an acid it splits up into formaldehyde and ammonia, the latter being neutralized by the acid. Ten grains three times a day well diluted with water give good results. If the urine is only slightly acid, neutral or alkaline it must be made acid by giving acid sodium phosphate or sodium benzoate *for a day or two before* the hexamine. Hexamine is very useful in the later stages of the disease and in relapses.

Failures are due to two common mistakes: (1) exhibition of the drug when the urine is alkaline; (2) combining the drug with acid sodium phosphate to render the urine acid.[1]

If the second mistake is made the hexamine instead of circulating in the blood as a non-irritating compound and splitting up in the urine, decomposes in the medicine bottle. I have noted this mistake in print several times.

An authority stated last year that he considered copaiba useless, and that it produced a rash in one patient out of every three. I can honestly say that I have never seen any benefit result from this drug, and that it often produces a rash and upsets the digestion. During the acute stage of gonorrhœa it does harm and during any other stage its value is doubtful. Sandalwood oil, like copaiba, owes its properties to a volatile oil. It is pleasanter to take and less upsetting to the alimentary canal. It imparts a very evident odour to the urine. It is a useful disinfectant and judging by the amount sold in various forms by chemists enjoys considerable popularity. Cubebs also contain a volatile oil. I have no experience of it in the treatment of gonorrhœa.

It will be seen from this survey that there is very little new in

1. Ruffer in the *Practitioner*, vol. xcvi, p. 405.

the treatment of acute gonorrhœa. Cases which do not yield to one or other of the methods described have passed into the realm of complicated and chronic gonorrhœa and beyond the sphere of this paper. The *fons et origo mali* must be sought for and dealt with.

When is a case of acute gonorrhœa cured? It has been said that every attack of gonorrhœa is curable except the first. We can all remember numerous cases which have relapsed after apparent cure as a result of alcoholic indulgence, sexual intercourse, or even unusual physical exercise. I remember a rather stout private of Marines who developed a discharge as the result of climbing the steep slopes of an island in the Red Sea. He had certainly had gonorrhœa long ago, but had had no chance of re-infection for weeks, and there was certainly none on the island.

The continental test is said to be the capacity of the patient to drink beer without provoking a return of the discharge. Another method is to make a provocative injection of silver nitrate in 1 per cent. solution and examine the resulting discharge microscopically. The Service method, which is simple and practical, is to stop treatment and to place the patient on eight days' quarantine, examining daily for the slightest evidence of discharge. The microscope is sometimes useful, but after all a gonococcus lurking in the recesses of the urethral mucosa may easily elude the most persevering microscopist.

Note.—Since the above was written Mr. Charles Russ, of London, has published a series of results in 100 cases treated by electrolysis (*Practitioner*, September 1916).

His views are more optimistic than those quoted. He uses a small platinized catheter which is easily passed, though sometimes a little 2 per cent. stovaine is advisable. No injections or lavage are practised. Sandalwood oil may be used when the discharge has become slight and vaccine is given in rheumatic cases. The series consist of 69 acute (arbitrarily fixed at under fourteen days' duration) and 31 chronic cases. The average number of treatments required in the acute cases was 16 (minimum 5, maximum 34). The average number necessary in chronic cases was 20 (minimum 14, maximum 35). Complications seem to subside with the urethral discharge, but epididymitis is noted as being one of the liabilities of deep urethral instrumentation during gonorrhœal suppuration.

It is possible that the method may become a valuable one in Naval Hospitals and sick quarters at depots.

[redacted] TO THE TRENCHES

[redacted] MARSHALL [redacted]

During the year 1916 [redacted] the Admiralty and War Office respectively to send a certain number of naval officers to gain experience of trench life and of conjoint [redacted] number of army officers to experience life afloat in H M ships under war conditions The object the authorities had in view was it may be presumed to strengthen the sympathetic bond coupling up the two great fighting forces of the Crown by affording to each opportunities to learn a little of what was going on in its sister Service For this purpose—so far as the Navy was concerned —officers were encouraged on their return, to give lectures on their experiences to the ships companies As one of those who were accorded the privilege of visiting the front trenches I am venturing to recount the impressions I gathered generally in the hope that they may not be altogether devoid of interest to other naval medical officers

At 9 30 p m May 23, on the Folkestone platform of Charing Cross station I joined up with Commander Maitland Irwin of H M S "Leon Major Hickson of the "Defence Mr Elliot, R M C of the New Zealand and about fifty men and petty officers from various ships of the Grand Fleet We arrived at Folkestone at midnight and as the train did not go beyond the town station we were compelled to march to the steam boat which lay alongside the jetty in the harbour a mile and a half away In consequence of this we did not get on board until an hour and a half after midnight but despite the lateness of the hour we found confronting us a huge supper, of which the men ate heartily before turning in, though I think most of the officers were only too glad to seek the seclusion of their cabins The boat was originally scheduled to leave Folkestone early a m on May 24, but for military reasons connected with the transport of troops was postponed until 5 30 p m of that day I must try and describe as briefly as possible the scene of embarkation Pouring in through the gates of the wharf one sees an incessant stream of khaki clad troops there is no shouting, no rushing wildly about in a word there is none of that "panic that accompanies faulty organization This living stream flows sluggishly but steadily along until it reaches a point opposite the first of three black-funnelled steamers lying alongside the jetty here a side branch spontaneously disentangles itself from the main stream and after threading the gangway up the first steamer breaks up as the men scatter themselves over the various decks A little further on a second stream diverges from the main one and pours itself into the central steamer This was the one we were in—and thus I was exceptionally fortunate in commanding a good all round view of the embarkation generally The end of the stream disappeared in the third ship As each man officer or lady—for there was a sprinkling of sisters nurses and others of the gentler sex in uniform—stepped on to the gangway, a pass had to be produced for the inspection of a transport officer stationed at the foot of the gangway As the troops poured inboard the

vessel took on a considerable list to starboard and one could see her draught steadily increasing as she settled down in the water. I believe the Board of Trade carrying capacity in peace time for these boats is about 800 men, but the exigencies of war have brought about considerable latitude in this respect and we certainly had more than 1,450 souls on board. In addition to the embarkation of the troops, there was all the time being quietly shipped forward much heavy gear, such, for instance, as Red Cross ambulance material, &c., and finally 2,000 bags of mails for our soldiers at the Front were dumped on board. A few women in uniform were on the jetty supervising some of the transport work, and one could not help noticing that a considerable proportion of the male transport personnel (blue lanyards appeared to be their distinguishing badge) were either elderly or had been wounded. Now the scene I have attempted to describe is to be witnessed any and every day of the week, either at Folkestone or Boulogne and a further evidence of the immense amount of labour and forethought involved in the organization of this section of transport were necessary I might dilate on the enormous number of troops that are daily conveyed across the channel proceeding on and returning from leave in the home country, or "Blighty" as it is affectionately known to Mr. Atkins. The moment the ship got under way all officers and men and of course women were served out with life belts. The sea was like a mill-pond and in a couple of hours, that is about 7.15 p.m., we were tied up to the jetty at Boulogne. Here we were met by an officer of General Haig's staff who informed us that three motor lorries and the General's own car had been placed at the disposal of the men and officers. The men were driven to a club and we were taken to the Hôtel de Folkestone, where we dined and slept the staff officer returning alone to headquarters the same evening.

At 6 the next morning, May 25, the car and lorries "shoved off" from Boulogne. At 9 o'clock we pulled up at a place about 30 miles from our starting point and in a *salon d'hotel* partook of a little light refreshment in the shape of a large basin of steaming chocolate and rolls and butter.

Now up to the present there was little to indicate that the country through which we were being carried was in the throes of a desperate war. Soon, however, we began to pass various working parties in khaki, mounted infantry, motor cyclist despatch carriers, ammunition lorries and so forth. The lorries for the most part were stationary enroomed, as it were, on the side of the road off the main track. Many of them, to judge by their interior, were mobile workshops, others were medical and in one we caught a glimpse of a soldier, head well back—in a dentist's chair.

We passed by several working parties—some of these we were informed, were composed of "Conscientious Objectors," others of the so-called "Navvies" of "Garrison Brigade." The work of these men consisted in road repair, wood cutting, quarrying, line laying, and so forth, all of which was carried out well behind the danger zone. There would

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For obvious reasons I cannot make any reference to points on the map. The reader will therefore forgive me for alluding here and elsewhere in these pages to localities in this very vague manner.

seem to be [illegible] impression among [illegible] people [illegible] every whisper [illegible] is Gospel truth [illegible] on the Continent [illegible] with [illegible] military. It would be superfluous [illegible] rumours have so [illegible] but I might [illegible] there as it was told me while at the [illegible] bility for its veracity or otherwise. A certain Member of Parliament [illegible] is or who—shall we say—poses as a sympathiser with the Conscientious Objectors had been led [illegible] into the belief that they had been placed by the military in unduly exposed positions and that they had in consequence suffered heavy casualties. He therefore got up in the House and demanded to know exactly what were the casualties sustained. I fear the answer he is alleged to have received was neither expected nor desired: "Casualties from [illegible] — nil. Seven cases have been under treatment for [illegible]." However, let us be just and tolerant, the particular [illegible] these men on the Continent devoid of the actual risks of [illegible] though it may be, is highly valued. Further, since their arrival on the Continent many of them have had their eyes opened to the real state of affairs, and have [illegible] the extremely illogical [illegible] position [illegible] held and are now joined up with the fighting forces. Working [illegible] of the Navvies or Garrison Brigade consisted of a somewhat heterogeneous assemblage of men curiously assorted as regards age and general appearance. They appear to have been recruited from all sorts and conditions; here was a man hardly out of his teens and there was one verging on seventy; here was an old regular, and by his side a man who had never seen what we should call "pucka" military service. Most of the men had been wounded and invalided out of the Service, but had recovered sufficiently to do this kind of work. And real good patriotic work it was too, as everyone out there will testify. The duties of these men again is well behind the firing line and of a nature as just specified. Now it may well be imagined that in a company or platoon of men, the units of which have been drawn from such very widely different sources and many of whom have never seen regular service, some amusing incidents occur. Thus on one occasion the General was coming down to inspect a piece of work—let us say a bomb-proof emplacement—these men were building. A small earthwork or parapet was being thrown up and the front portion of this was covered with slabs of turf which should have been so placed that the grass side was outermost, so that from a distance the emplacement would assimilate with the general environment and be more or less invisible. By a mistake, however, the grass side of the pieces of turf had been laid innermost. When the General arrived he found the officer in charge had fallen in all his men with their picks and shovels to receive him. The General's first remark was: "Bet [illegible] Mr. So-and-So, you've turned the sods the wrong way!" Of course the General was referring to the turf, but the platoon officer's response was: "Squad, about turn!"

At 11 a.m. we arrived at a town with a large market square that was literally crammed with motor lorries of every description. Here for the first time we heard the boom of distant artillery. Very few male civilians were in evidence and the majority of the few women going about their business were in black. The following incident may interest those who

have to do with horses. A mounted officer was trying to get his horse to enter a certain side street, across a part of which had been placed a temporary barrier to stop wheel traffic, but which allowed of ample space for the passage of a horse to last, this horse had been past this particular barrier some dozens of times. To-day, however, despite whip and spur coaxing cursing and pulling the horse for some unaccountable reason obstinately refused to enter that particular street. The puzzled rider was about to give it up and turn away when a little boy, pointing to a brazier lying underneath the middle of the wooden barrier, called out "Fumée!" A scarcely noticeable wisp of smoke was rising from the brazier but the horse had spotted this and taken exception to it. The brazier was placed on the pavement and the horse walked past the barrier of his own accord. We had lunch at the officers' mess and the petty officers were conducted to the N.C.O.s' mess for the same purpose. After our refreshment we were shown some large maps and given a general birds eye view of the situation by one of the staff officers. Each one of us was given a map of the trenches and, finally, every member of the party was provided with a shrapnel helmet and a gas helmet and was put through a "gas drill," that is to say, instructed how to use his gas helmet. After this we got into the car the men into their lorries, and were whisked off towards the trenches and in a few more minutes pulled up and dismounted, having arrived at the end of our journey so far as petrol was concerned as a motive power. We were now at a farm about a couple of miles from the nearest trench line. Here we were split up into four groups averaging a dozen to the group, one under Commander Maitland Kirwin, one under Major Hickson, one under Mr Elliot and one I accompanied. I saw nothing of the other three parties until the day that we returned to Boulogne, so that my future remarks are confined solely to my own.

To the Firing Trenches on Foot

First of all I was conducted to the Brigade Headquarters, where I was introduced to and had tea with the Brigadier General. The sound of our own artillery was close at hand and I could make out the position of one or two of our batteries. That we were now well within the zone of the enemy's shell fire was evident from the whizzing concussion and cloud of dust, that here and there one heard and saw around. Tea over I was conducted from Brigade Headquarters to the Battalion Headquarters, a stage nearer by about a quarter of a mile, to the front trench. Here I met the officers with whom I was to spend the next few days, and very lucky I was to have hit off a rehel night—an event as I will describe later, of immense importance in trench warfare—for a company of the officers and men were preparing to go down that very night after dark to relieve the company now in the trenches, and it was with this company that the naval men and myself were to go.

Of course the Army officers were all very interested in the Navy, wanted to know all about the work we were doing especially with our submarines. I, on the other hand had my interest centred in their doings, but as soon as I manœuvred the conversation round to Army work back they would switch it to the Navy. Especially interested was Captain B—— in the Navy—he himself having once been a naval cadet

at Osborne. I asked him why he left our Service—perhaps rather a tactless question as it caused a certain amount of hilarity—and he spun the following yarn which I will repeat in his own words. "It was all owing," he said laughing, "to a spirit steel cube. I was undergoing a course of instruction in the workshops and my instructor handed me a steel cube and told me to turn it into a sphere of that metal. After many days hard work I produced my sphere only to be told 'I'll you cannot do better than that try and turn the steel sphere into a cube.' So I worked away and made what I thought was a fairly good cube but no my instructor was not satisfied and told me to convert it into a sphere. Well this went on until there was neither sphere nor cube left—all had disappeared in turnings. Shortly after that I was sent to the "Hermes" and spent three very seasick weeks at sea, after which I left the Navy. Captain B.—— had been out at the Front ever since the beginning of the War. He was a great favourite with his brother officers and the General spoke of him as one of his most promising subordinates; he had already won the Military Cross, and his men simply worshipped him and would follow him anywhere to start the Navy had lost, and the Army had gained, an exceptionally good officer.

The Battalion Headquarters are situated in an ideal spot on the sheltered side of some rising ground about 1 600 yds. from the trenches. The whole of this elevated ground, which I will call Hill 'x' ("x" indicating its height. Hill 40 or Hill 100, for instance, means that the hill is 40 or 100 *metres* high) is thickly covered with trees, and this also applies to half a mile or so in rear of the hill. This wooded district has scarce a tree that does not show gashes or holes made by shell or from the back of which one could not scoop a shrapnel bullet. Many of the trees had been actually felled by shell and the stumps of the trunks 5, 10, 15 or 20 ft. high as the case may be, are to be seen, scattered about the wood, frayed and frizzled out at the top like so many monstrous shaving brushes. The shell that daily fall into this wood appeared to be of four kinds so far as my brief experience was concerned. The daily "strafe," generally between 7 and 9 o'clock in the morning, was with a small howitzer shell about 4.5 in. to 5 in. calibre; this burst on impact and, if it struck the ground, made a crater about 3½ ft. deep 3 ft. wide (as measured at right angles to the shell's travel) and 4 ft. long (as measured to the line of the shell's travel). If these missiles struck a tree squarely even though the latter was 9 or 10 ft. in circumference, they burst during perforation and so severed the trunk. They came from enemy batteries 5 000 to 6 000 yards distant and had a high angle of descent and one could hear their moaning approach many seconds before they struck. It was interesting to watch the behaviour of the well seasoned old timers when these shells were flying around during a "strafe." Directly he heard the moan of the approaching shell he would stop turn his ear to the source of sound, and then carry on unconcernedly with what he was doing; some seconds later the air would reverberate with the burst of the shell two or three hundred yards away or he would run and scramble behind a tree trunk if the shell threatened to fall in his immediate vicinity. The seasoned soldier never "ducks" at a bullet or shell of high velocity for he knows that he hears it *after* it has passed, the high angle shell, lastly following in the wake of its own sound wave gives him a certain amount of warning as to when and

where it is going to descend and he aligns his conduct appropriately Then there were the 'whizz-bang' shells impatient high velocity flat trajectory, 3 in calibre missiles, that came passed and burst all in one set so to speak Some of these fell in the outskirts of the wood but few succeeded in reaching the middle they were however, unpleasantly common on the top, and along what we would call the weather side of the hill They were fired from batteries much nearer our lines than the former type they also were impact bursting shell Then there were shrapnel shell which, as a rule, burst high overhead by means of a time fuse They gave rise to a curious echo that reverberated through the wood and differed from the two previous types in that they threw up no cloud of dust Furthermore after the burst up in the air one could hear the pellets and fragments falling through the trees As a rule they left but a small trace in the air of their bursting site though occasionally they left a dense white opaque cloud I shall refer to this latter at a later period when I come to describe how the Germans obtained the range of certain woods they suspected of concealing our howitzers Finally there were the anti aircraft shell fired by the enemy at our aeroplanes These were constantly falling in the wood when our planes were near the enemy lines Two fell near my dug out early on the morning of May 29 and I brought them back with me as mementoes of the good time I had out there they are approximately 3 in calibre and when full, with time fuse &c. attached weighed about 18 lb shell of this type contain a charge in the base the time fuse being in the nose of the shell and connected with the bursting charge by a hollow tube running down through the centre of the shrapnel balls They burst very high up in the air, the actual height depending of course on the altitude of the air craft The detonation of the charge in the base of the shell blows off the anterior ogival end and throws out the shrapnel, but does not burst the cylindrical case which falls several seconds after the appearance of the white cloud up in the air, intact We may assume I think that on bursting these shells still retain a fairly high remaining velocity and that they are oriented more or less nose upwards that is towards the aeroplane Hence when the basal charge is detonated the shell as a whole behaves like a gun that is itself travelling through the air so that the velocity of the shrapnel balls on their departure from the case is the remaining velocity of the shell plus the additional velocity imparted by the propulsive charge in the base of the missile This would account for what I noticed on more than one occasion when our aeroplane was being shelled First, one could see a puff of white smoke appear somewhere below the aeroplane high up overhead then four or five seconds later one would hear the report of the bursting shell not for another fifteen seconds or so did the empty case crash into the undergrowth, and yet a further ten seconds lapsed before one heard the thud of the now pierced the rattling amid the branches of one or two of the widely dispersed shrapnel balls One of these empty cases struck the dug out behind that in which I was on the morning of May 29, narrowly missing the Sergeant Major who was standing about 4 ft in front of the entrance to the dug out shaving I was similarly occupied in front of my own dug out, heard the noise but had no idea it was so close until the Sergeant came up to ask me to go and see the narrow shave he had had I went The shell had passed through one sandbag at the edge of the roof of the

[illegible] had [illegible] itself about a few [illegible] sandbags that [illegible] project to the entrance, [illegible] been down, its [illegible] pointing [illegible].

[illegible] that night, May 25, and [illegible] the relief party [illegible] off for the trench [illegible] by [illegible] party. By the time we reached the top of the hill it was dark, but despite the darkness and the rain a most wonderful and impressive sight was laid open to our view. The whole of the German trenches, and with them of course our own, were lit up at intervals by powerful star lights, which were being incessantly shot up into the sky over a line as far as the eye could reach from right to left. It was like a firework display. You would see a snake-like trail of sparks rise in the air to [illegible] or so, and then a glorious burst of white light which would slowly [illegible] earthwards, lighting up our whole trench line as though a searchlight was being played on them. These star lights and [illegible] lights threw their maximum illumination over our own trenches, but they also lit up the ground for several hundred yards on either side [illegible]. No Man's Land and the German trenches. [illegible] light [illegible] shot up from our own trench line, so I asked the Captain of the company the reason of this pyrotechnic display on the part of the Huns and why we were not contributing to it. "The Germans have got the wind up every night [illegible] they are like children—afraid of the dark. We have no reason to fear a night attack, and even [illegible] there is no need to strike lights and waste money while [illegible] descending." "Wind up" is a [illegible] for what the Yank would call "[illegible]". [illegible] it would appear that the enemy are now in constant dread of [illegible] along the whole front, and especially of one [illegible] cover of darkness. The use of star lights is therefore an expression of [illegible]. From sunset to sunrise there is at least one star light in the air every 300 yards [illegible], often there are three or four, and I estimated roughly that [illegible] 1,000 must be expended per mile of [illegible] during the short hours of summer darkness [illegible] expense. We were now spread out in single file about [illegible] paces between each man, and strict silence enjoined. As we [illegible] down the hill side we found the star lights very useful to us in showing up the various pitfalls and obstacles, but as we got nearer, the sharp crack of rifles and the deeper stutter of the machine guns [illegible] of the [illegible] of passing bullets and the "[illegible]" of those striking the ground made one wish that [illegible] less lavish with their illuminations. Imagine the feelings of a man on the stage, faced by an unsympathetic audience, when the [illegible] turned full on to him and he discovers he has forgotten his part [illegible] of which it is to find himself standing [illegible] upon [illegible] from within three or four hundred yards of the enemy [illegible] with a [illegible] light like the arc lamp of a [illegible] his head. [illegible] it may seem, provided one kept perfectly still while the light [illegible] and one was quite invisible or rather [illegible] less Irish [illegible] outline so assimilated with the [illegible] of an average [illegible] that it was impossible at a hundred yards to differentiate between them. We passed a working party of sappers [illegible] a trench for a telephone wire, and I could not help noticing the attitude of one of the [illegible] caught, so to speak, by a flare light while in the act of shovelling [illegible]

a spadeful of earth There he stood rigid and motionless as though carved in granite, back bent, face turned to the ground, and in his hands the spadeful of clay When the light went out he resumed his digging Footbridges over ditches and brooks cross roads and any point towards which men would be compelled to converge, required extra careful negotiation for the bearing and distance of every one of such nodular points are known to the German snipers and machine gunners who have an unhappy knack of suddenly straking them on the chance of bagging someone Across such points, therefore one had to stoop and run for it, or if it was in the daylight crawl across On one such footbridge I came across the following laconic advice painted on a signpost, "If you stoop you'll get it in the neck and if you don't stoop you'll get——!" A notice such as this appeals to one one recognizes its honesty and simple lack of all ulterior motive! There was one very nasty quick firing gun that compelled us all to lie flat, but fortunately it only went off at about ten minutes' interval The gun was obviously fired while being swung through a horizontal arc, so that the pattern of the bullet tracks was that of a fan, the handle of which was at the muzzle of the gun and the top curved edge of which was our front parapet, and all the bullets that missed the parapet came zipping into the open ground behind across which we were leading our way Now this machine gun would fire from right to left and then it fired from left to right Nearly all casualties as the reader might well guess are contracted not in the front trench itself, but in the open ground behind among the working parties or the reliefs that is the reason why each side is so anxious to learn the relief nights of the other, for the chances of planing men *hors de combat* is then immensely increased and well worth a higher concentration of fire Now all this time one has to imagine the ram as coming down in torrents and our train speed as very slow Our men were slipping about everywhere and every now and then one would hear a splash and a heartfelt imprecation as some extremely un jolly tar scrambled out of a flooded crater to the accompaniment of the but partially suppressed chuckings and gigglings of the more sure footed and more practised soldiers Another 100 yds or so and we had arrived at our destination—the firing trench, barely 200 yds from the Boches line We did not form a very impressing spectacle, most of us looking extremely wet and bedraggled But we were cheery withal 'Hello there' cried out one of the Tommies to our Blue jackets 'What regiment are you?' "North Sea Maritorials" was the prompt reply It was now 11 30 p m the men were allotted their dug outs but it was discovered there was no sleeping billet for me owing to the fact that it was relief night and an extra number of officers had to be accommodated There was nothing for it I would have to face that journey again and go back to Battalion Headquarters I would willingly have slept in the open against the rear parapet where it would be perfectly safe but the ground was inches deep in water and the rain was descending in torrents I remained in the trench therefore, until all our men had turned in and I had seen all there was to be seen and at 12 15 started back to the company of a sergeant as guide I won't describe the walk back, how my guide, owing to the intense darkness, lost his way time after time but will merely say that I arrived back at 2 20 a m very weary to find the Adjutant sitting up and somewhat concerned as to my whereabouts, for the Captain of the company had telephoned

from the enemy's way I had left it at midnight I was all my clothes and kit into day and was speedily dead to the world until the next

At 5 o'clock on (May 26) I awoke with a start to the concussion of a howitzer shell which seemed to me to shake the whole of the wood and which undoubtedly shook the dug-out to its core For half an hour shell after shell fell among the trees, and overhead our own four-point nines went shrieking past on their errand of retaliation It's just the morning strafe said Carrie "sometimes it's one wood and sometimes it's another to-day it is ours They give it us, and we take it as methodically as a morning cup of tea—in fact as a rule we do not even bother to wake up At 9 a.m I was once more on my way to the trenches, but this time instead of going by the short route taken under cover of last night's darkness I had to go by a long and circuitous path, striking the trench a good half mile to the west of the company with whom I was billeted and being, therefore, compelled to thread my way through a regular maze of front trenches held by another regiment At last I came to a brook, dignified on the map by the name of river crossed this, and was in my correct trench and very soon in the officers' dug-out which figures as the mess and sleeping quarters On that particular morning the enemy had turned a howitzer battery on to a hundred yards of trench connecting us up with the next regiment to our east, and a pretty old havoc they had made of it too Most of the front parapet had been razed to the ground, props had been broken up and sandbags scattered far and wide Fortunately this portion of our trench line was very thinly occupied at the time and the Captain of the company was able to withdraw every man without sustaining a single casualty The estimated damage was shown by the Company officers demand for 4,000 sandbags which were sent up to Headquarters that same morning These sandbags are valued so I was informed at 3d apiece hence that morning's strafe on our bit of trench cost the Government just £50 for sandbags alone But what did it cost the enemy for shell? The prevailing idea at home is that men in the trenches when under shell fire fly for refuge to their dug-outs whereas the exact opposite is the case, they leave their dug-outs and spread themselves out behind the parapets The trench dug-outs are made as a protection against rifle machine guns, and trench mortar missiles and grenades and they are not constructed to withstand the shock of heavy plunging shell from howitzers which blow them all to pieces and would kill every man inside And so on the principle that under certain circumstances it is better not to have all your eggs in one basket, it is found that casualties are reduced to a minimum by spreading the men along the fire-side of the parapets When we come to deal with the dug-outs in positions further to the rear such as those in the observation posts, Battalion headquarters howitzer and field artillery batteries we shall see what a complicated structure a modern shell-proof dug-out really is The Germans on the contrary do construct shell-proof dug-outs in connection with their front-line trench that is to say they rabbit-hole down into the ground at intervals along their trench line and so spacious are some of these shelters that in more than one instance where we have captured a front-trench we have found a piano in the dug-out

I will briefly describe the section of trench held by the regiment with which we had the honour of being billeted The German and British

trenches separated by about a mean 200 yards of No Man's Land running approximately from north west to south east Our trench was separated on the left from that of the next regiment by one river and on the right from that of the next regiment by another river—I say river because they were so called but they are only small streams

Now this stream runs first through the German lines then through the British lines then again, after being joined by another stream flows again through British and again through German lines and on this curious disposition hangs a tale

Notices are posted up in the trench at the points where the brook crosses it "*Men are not to use this water for drinking or cooking as it is liable to contain copper sulphate*" I do not think the soldiers of the present regiment ever had any cases of poisoning from this source though I was informed that there were such cases among their predecessors

Most of the original Belgian names have disappeared and have been replaced by such pet names as appeal to the soldier for instance, Regent Street Piccadilly Circus the Elephant and Castle, and so on or by names that are clearly stamped with their origin such as Mud Corner Shrapnel Alley Stinking Farm Hot Corner &c Here was once a fine house until it attracted the German eye it is now a pile of bricks that pathetically figures in the military map as "Donald's Ruin" How a Scots name came to take up his residence in this part of the world, we are not told though it is comforting to be assured his ruin was neither accompanied by wine whisky nor women but by whizz bangs Now that I have given a bird's eye view of our trench environment let us return into the trench itself When I arrived I found every one communicating with excitement on account of the howitzer strafe an experience they had not had for some months The Commanding Officer was particularly pleased with himself in that he had not sustained a single casualty though he shook his fist at the Huns when he realized the amount of night labour the repair of the hundred yards of damage would entail I couldn't help thinking of Burnsfather this morning" he said laughing "In the middle of that strafe, with sandbags flying about all over the place I was called to the telephone and the message I received was "Send names of two men for next furlough" It reminded me exactly of Burnsfather's picture of a dug out being blown to smithereens while amid the din the officer inside slowly spells out the message from Headquarters "How many pots of raspberry jam were issued to you last Friday week?

To-day was a fine hot summer's day and our men were chatting with the soldiers and drying their clothes after last night's soaking I could not help overhearing a Tommy explaining the general situation to one of the sailor men He was pointing towards the ground across which we had come last night and said, indicating some craters "Do you see all those holes filled with water? See em? See em? indignantly asked the blue jacket "Didn't I battle in em?" To-day Captain E was sent with some written orders to the detachment on the other side of the river already referred to on our right, and as men and officers are not supposed to go about alone but in couples in case of accident I asked and obtained permission to accompany him The difficulty was to get past the hundred yards of trench the parapets of which had that very morning

been laid, at intervals [illegible] trench was, of co[illegible] which just here ra[illegible] had to crawl on the [illegible] We arrived at the break without mishap [illegible] by lying full length on the plank and pull[illegible] arms lut by lut. Twenty more yards and we [illegible] and could once more walk in an upright position. We [illegible] mud and streaming with perspiration, for the day was [illegible] And I had come so after Captain D. had [illegible] opportunity of seeing one of our trench guns being taken [illegible] the purpose of being cleaned.

After a rest in the officers' dug-out and a little liquid [illegible] we commenced the return journey. Again we crossed the [illegible] entered the damaged communication trench. Captain D. had just halted past an open gap when a bullet whistled through it and splashed into the mud. So we sat and patiently waited, one on either side, and it was well we did so, for in the next five minutes three more bullets came through that gap and then the sharpshooter let it alone. He had spotted us both going down and Captain D. returning, so knew there was one unaccounted for. Needless to say, when the unaccounted-for one did cross, it was in the primitive method of the limbless serpent. When I had got up to my companion he had crawled on a little way—I found him lying down and having a bead on some object with his revolver. Unfortunately the object saw my head coming round the corner and scuttled off in the shape of a large brown rat. Rats are so numerous that one of the officers obtains a certain amount of revolver practice by potting at them in the unoccupied communication trench. In the [illegible] to judge by their number, have a fairly safe time of it. This afternoon two or three German aeroplanes came over our lines and were shelled at by our anti-aircraft guns. It was a pretty sight seeing the track of the enemy plane mapped out, as it were, by what looked like white tufts of cotton wool against the clear blue sky, for each shell as it burst left an opaque white cloud which remained suspended in the air for several minutes before it was gradually dissipated. While we were at lunch today in the dug-out the enemy treated us to a fusillade of rifle and mortar grenades, which fell just behind our rear parapet. As a rule these are ignored unless their number and zone of fall are such as to indicate that the enemy's fire is not sporadic, but is organised and concentrated on some particular portion of our trench. Then one resorts to what is called "retaliation," which consists simply in giving him back a more liberal and stronger dose of his own medicine. Having ascertained by means of the periscope whence the enemy missiles emanate, a bombing party is despatched to reply to the fire. This is generally sufficient to make Master Fritz behave himself, especially if we turn a trench gun on to him, but if it is not, the artillery are appealed to by telephone for retaliation. On this particular occasion Fritz was unusually obstreperous and disdained our bombers by sending over "pineapples," which shook our dug-out to such an extent that it literally wobbled, and for an instant I thought it was going to collapse. The pineapple is the aerial torpedo, a large trench mortar missile 4 in. diameter. This made G. very wrath, and he sprang to the telephone

rang up the observation post and said, "We are being [illegible] with pineapples; please retaliate." Then he turned to me [illegible] "Now listen!" Within four minutes a dozen of our shells were [illegible] overhead and bursting around the point the map reference [illegible] had given. The enemy did not worry us again for [illegible] long time. Presently the telephone bell rang. The message was simply [illegible] "How's that?" and the reply equally so: "You've put the wind up them! Thanks!" Not always, however, was the result [illegible] satisfactory; the shells were over or under or had [illegible] or perhaps they even fell into our own trenches. When you realise that our gunners were some four to six thousand yards away, that their bearing and range finding had to be done entirely by map and compass, for they never saw their objective, when finally you remember that ours and the enemy trenches were but 150 to 200 yards apart—and in some places they are closer—it will be realised that to put a shell into one's own trench is after all not such a very great crime as at first blush it might appear to be. It takes a very slight change of meteorological conditions to shorten a 5 000 yard range a couple of hundred yards. When shell fell short the reader may well imagine the telephone messages were not always so affable and amiable as those I overheard. On one occasion it was: "If you must shell us, please stop firing." The gunners stopped. Some hours later the infantry again rang up the gunners and asked them to "retaliate" on a machine gun that was annoying them. The answer sent back was: "If you can't stop a machine gun with your own machine gun you must lump it." There was always a little quiet "leg-pulling" between artillery and infantry. "Was the firing satisfactory?" the gunners once inquired. "Oh quite, thanks. You didn't hit us!" Every one of the infantrymen, however, were agreed on one point, and that was that the shooting of the gunners during an advance or general attack was marvellously accurate. Weapon to weapon it was superior to anything the Germans could do. The French, despite their indubitable success with their 7·5 centimetre gun, were unstinting in their praise of our artillery. Said a French officer to one of ours anent the shooting of our field guns: "C'est splendide, magnifique—what you call 'not bad.'" At 6 30 p.m. this afternoon five of our aeroplanes passed over our lines on their return from a raid; they were very high up in the air. At 9 p.m., while at dinner, more "pine apples" fell near our dug-out, but there was no need to retaliate, for they soon stopped. Just after dinner I had to go out into the open to attend a sapper who had been hit in the abdomen by a bullet. The latter had not passed out, so considering the close range it was probably a ricochet. The star lights were very useful for examining and dressing him. The unfortunate man was vomiting blood, so it was a bad case, and nothing could be done except ease his pain with morphia and despatch him by the bearers to the collecting station at the back of Hill x.

The few casualties I saw were all sustained in the open, about 100 to 300 yds. behind the front trench, with two exceptions which occurred in the trench itself at night time, one of which was a bullet wound of the forearm and the other of the head. The latter undoubtedly owed his life to his shrapnel helmet, for the bullet, which was from a machine gun, key-holed through about 4 in. of the steel helmet, then cut a thin gash in the man's scalp grazing, but not perforating, the skull, after which it

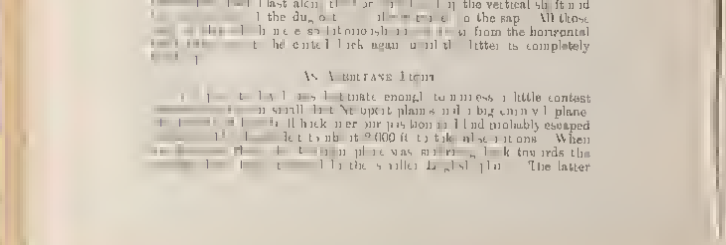
again p[illegible] and so on to [illegible] hat rises buckled and [illegible] head, [illegible] upset over a wid[illegible] He p[illegible] is uncon[illegible] ecovered I presume [illegible] heads [illegible] were looking on our lines to [illegible] to pick them out from the very regular [illegible] which was clearly discernible while [illegible] Whenever a trench mortar or machine gun was [illegible] high bearing by means of sticking two empty cartridges [illegible] parapet so that they formed a straight line [illegible] The bearing was taken with a luminous compass I think I have already remarked when describing our march down to the trench through the open that one of their machine guns went off at regular intervals sweeping the top of our parapet first from left to right and then back again from right to left The intervals were very regular indeed it was though by some on this account that the gun was fired by machinery This gun was so accurately trained and swung round that the bullets skimmed the top of the parapet in places

Emily—that is about 5 a m —next morning, May 27 1916 I awoke to the shaking of the dug out by a prolonged [illegible] going off behind or in front it was impossible to say which of the trench It was a small dug out for two people and my fellow occupant Lieutenant J was peacefully snoring above my head were two rats going through their morning ablutions washing their faces and smoothing out their whiskers with their fore paws That these animals were old and tried warriors was proved by the fact that if I moved they hid behind the beam coming out again in a few minutes if I remained quiet, but on the other hand the report of a bursting grenade or the noise of a passing shell did not worry them in the least One grenade burst so close to the entrance to the dug out that some of the mud which it threw up fell on to the rug under which Lieutenant J continued peacefully to snore but the rats only paused for a brief second, patted the beam with their fore paws and skipped an expression which said plainly these words " Say, that was a bit near, and then carried on with their scratching I was fortunate enough to secure the copper rod of this last grenade as it was only a few yards from the dug out

My Trip down the Sap and below No Man's Land

Let me try and describe a sap as best I can One goes into a dug out and sees what looks like the entrance to a well above which is a windlass being worked up by two sappers Presently four dripping bags of blue clay appear and are hauled aside taken off the hooks and put into a small hand trolley and this when full is wheeled along tiny rails out of the dug out and along the rear of the trench to a point where the bags are taken out and made use of for building the lower portions of parapets The rope and hooks are then returned to the bottom of the vertical shaft of the sap and the hauling up commences afresh But there are yet three other couples of men turning wheels and three snake like pipes curling over the edge of the sap and disappearing in the blackness below advertise their functions One pipe is delivering fresh air to the extreme end of the horizontal shaft below in which the sappers are digging their way towards the enemy lines another pipe is sucking out the foul air,

An Adventure Begins



was [illegible]. The track of each [illegible] was mapped out in [illegible] white puffs which [illegible] the machine [illegible] a bicycle. [illegible] two machines [illegible] the non aeroplane [illegible] British and German [illegible] imagining them [illegible] and the tufts of [illegible] further to appear in the [illegible]. Now we heard the [illegible] gun spit out its stuttering, but [illegible] was no response [illegible]. Presumably they came [illegible] towards. By this [illegible] were right over our heads [illegible] almost in vertical [illegible] apparently being [illegible] the other. The excitement [illegible] all the occupants [illegible] out and [illegible] expecting every [illegible] see the German [illegible] down. Suddenly some [illegible] out "Look out [illegible]" in less than two seconds with the exception of the sentry [illegible] everyone had literally dived for shelter. I did [illegible] of "Pipping" until I heard a disdaining [illegible] that they were [illegible] rifle grenades. [illegible] only fired one volley. Presently the [illegible] other emerged laughing. "Serve us right! [illegible] get killed by [illegible] one of these days," he said. "They've been the same thing every aeroplane fight that has taken place anywhere near the lines. They know full well that the silly Englander with his [illegible] love for any sort of a sporting [illegible] will be sure to be watching it [illegible] for the critical moment and then fire off a round of rifle grenades." We've seen two aeroplane duels from this trench in the last month [illegible] ago a German plane was brought down well behind our lines, and as it was actually falling, through the air, they [illegible] grenades [illegible] over the way. But to return to the [illegible]. When it seemed that our man was right on top of the German he [illegible]—probably because he was getting too far over the enemy lines—wheeled round and returned to his own lines. There were two [illegible] German aeroplanes around this district that used to figure overhead [illegible]. The smaller one was [illegible] below and in consequence was [illegible]ately known to the Tommies as "The [illegible] Bill." The other, much larger, was usually only seen towards evening when it would soar majestically up and down the German lines. Owing to the [illegible] with which these evening [illegible] it received the sobriquet usually accorded to ladies of lax virtue.

Trench Routine Day and Night

Everyone admits that the Germans could take our trenches any day they wished to do so and the enemy would be equally ready to [illegible] that we could occupy theirs. But [illegible] counter-attack [illegible] carried out by the evicted occupants on the same day would force the new occupants to retire. The counter-attack must be immediate, however, as then one gets the new occupants at their maximum disadvantage, for they are in strange environment, cut off from all communication with rear positions and chaos of necessity prevails. In twenty-four hours, if left alone, they will have consolidated and co-ordinated, hence a counter-attack to be a success must be immediate.

The telephone arrangements for linking up the several regions of the

On Ap[illegible] of our ne[illegible] over the Gra[illegible] dropped tw[illegible] the battlefield, [illegible] shaped objec[illegible] footballs, and almost [illegible] immediate bec[illegible] of the Canadian who [illegible] to me—for [illegible] beyond the sphe[illegible] of devastating bomb This is pret[illegible] what happene[illegible] when eventually the footballs *did* stop bouncing and Fritz's curiosity overcame his cautiousness he found written on them Sorry bomb! April 1 Now, it may be said this is all very childish and silly but Fritz is sadly puzzled that very day it may be, he has heard ominous whispers of food riots in Berlin whereas from the official accounts he has been in the habit of receiving it is London that should be the scene of such riots And so he goes through mental torments in his futile efforts to adjust his conception of the relative situation comfortable to what he is told and to what he sees and hears How is he to reconcile his Government's assuring bulletins with the persistent rumours of famine riots in his capital? How is it possible for his enemies to be so light hearted and indulge in such drolleries as that he has just witnessed when their metropolis has been burnt to the ground and their fleet utterly and for ever vanquished?

(To be continued)

Clinical and Practical Notes.

NOTES ON THE EFFECTS PRODUCED BY A SUBMARINE MINE EXPLOSION

By Fleet Surgeon W. L. Mathew, R.N.

In August 1916, one of H.M. auxiliary ships was torpedoed by a German submarine and sank stern first in about fifteen minutes.

When the ship sank the majority of the crew had abandoned her, some in boats, others swimming or clinging to flotsam. One boat however on the starboard side with a double crew had failed to get clear and was overturned and drawn down by the vortex. The officer in charge of this boat and such of the crew as were saved felt themselves driven upwards towards the surface by the force of a mine explosion. Although they must have been almost vertically over the mine and not much more than 10 feet from it when it exploded none of them felt any ill effects.

The effect produced by the mine explosion upon the men in the water at different distances astern of the ship and in the majority of cases further from the exploding charge than the boat referred to was marked. In varying degrees they all experienced the sensation of a violent blow upon the immersed parts of the body and several became temporarily unconscious. The occurrence took place at about 9 a.m. and the survivors were received on board the hospital ship 'Soudan' at 12 noon.

Ten cases presented symptoms much in common and gave a history of hæmorrhage from the nose and ears. After having been picked up two passed blood stained urine, two blood per rectum and eight had hæmoptysis. On admission to the hospital ship there was a rise of temperature in seven cases, transient in the majority and probably due to shock. All had more or less acute abdominal tenderness and (with one exception a private R.M.L.I. who at the time of the explosion was being lifted into a boat and immersed only to the waist) complained of a sense of constriction about the chest. One officer had retention of urine. These symptoms passed off in three or four days except in three men whose cases are given below.

J. H., an A.B., R.N.V.R., was in the water some distance astern of the ship when the explosion took place. He felt a blow distinctly over the whole body. After being taken out of the water he spat up blood, and passed blood stained motions. His temperature on admission was subnormal, there was tenderness over the abdomen, and the reflexes were rapid. The temperature rose for the first three nights and on the fourth day he began to pass three to four dark tar coloured motions daily and had pain after micturition. These symptoms passed off after eleven days treatment and two days later he was discharged to his depot ship for passage south.

W. W., an A.B., R.N.R., was clinging to a spar about 100 yards astern at the time of the explosion. Blood poured from his nose and he became unconscious and did not completely recover until lifted into a boat. He spat up a quantity of bright blood and passed pure blood per rectum. He was still suffering from hæmoptysis on admission and was passing

[illegible] His temperature rose and remained [illegible] There was abdominal rigidity, with slight dul[illegible] Forty-eight hours afterwards diarrhœa [illegible] t desire to defæcate He had difficulty [illegible] on one occasion required a catheter The [illegible] quantity [illegible] and dark grey in colour He [illegible] discharged to the hospital train at Leith after [illegible]

[illegible] estimated he was in the water about 130 yards [illegible] still visible when the explosion occurred He [illegible] coughed up a quantity of blood On admis[illegible] and very small and temperature subnormal He [illegible] over the epigastric region, and the abdomen [illegible] palpation He was still expectorating blood [illegible] loped abdominal distension probably from ileus, [illegible] resonant throughout with no dullness to be [illegible] he complained of pain and tenderness in the [illegible] On the 28th diarrhœa set in with tenesmus [illegible] passage of dark liquid motions There was [illegible] His temperature ran a slightly elevated [illegible] the abdominal symptoms had passed off the [illegible] and he was steadily improving when dis[illegible] eighteen days treatment

[illegible] closest to the mine but more immediately [illegible] the effects less than the men in the water at a [illegible] In the former case there was probably little weight [illegible] of water over them while in the latter the "thrust" reached them [illegible] horizontal direction and they were violently compressed in the [illegible] Hæmorrhage [illegible] have taken place from the pul[illegible] capillaries intestinal and [illegible] membrane and into the [illegible] cavity itself

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NOTES OF THREE CASES OF CHRONIC INTERSTITIAL MASTITIS IN THE MALE

By [illegible] KENNETH [illegible] JONES, M.B., R.N.

[illegible] view of the comparative rarity of [illegible] the following [illegible] are placed on record —

Case 1 —Boy aged 15 This boy [illegible] the sick bay and exhibited [illegible] marked enlargement of the left breast which was both prominent [illegible] drooping and about four times as large as the right On palpation [illegible] was a good deal of tenderness and [illegible] thick and [illegible] and [illegible] but hard nodular masses could be made out [illegible] the substance of [illegible] gland The condition of the right breast was normal

The condition had been noticed by the patient for several days but [illegible] not caused him very serious inconvenience [illegible] was kept [illegible] observation and the tenderness gradually disappeared [illegible] the [illegible] the thickened trabeculæ and the nodular masses [illegible] [illegible] or no change The patient was under observation for [illegible] [illegible] and during that time he had one recrudescence of [illegible] trouble [illegible]

a semi acute form which lasted about a month but did not prevent him from doing a certain amount of work

His was of a most unstable and [illegible] temperament and eventually he left the ship under observation for mental disease having threatened to commit suicide At this time [illegible] was well marked

Case 2.—A stoker, aged 24 While in the sick bay and whilst undergoing a physical examination for another reason this man was observed to present a well marked enlargement of his right breast He could give no definite account of the initial phases in the alteration in size and appearance of his right breast but stated that the enlarged part had previously been tender and that it had subsequently become normal in feeling if not in aspect A physical examination demonstrated a condition precisely analogous to that of the preceding case, thickened trabeculæ and nodular masses were present with a general overgrowth of the part

He suffered no inconvenience made no complaint, and left the ship soon afterwards and was lost sight of

Case 3.—A stoker, aged 21 This man came to the sick bay with a very well marked enlargement of the left breast and with a definite history of the trouble having begun during or shortly after, a heavy coal ship the previous day A careful examination of the part demonstrated that it was in precisely the same condition of sub acute mastitis as the other two cases recorded above The man was kept under observation for several months and the more acute symptoms and to a much less extent the accompanying signs of inflammation gradually decreased

As in the first case severe exertion induced something resembling a recrudescence of the more acute symptoms The breast affected remains permanently enlarged to perhaps three times the size of the other and thickened trabeculæ and nodular masses are easily demonstrable in its substance

Treatment.—In the most acute stages of these cases it was necessary to restrict to some extent the use of the arm on the affected side. Belladonna locally and generally was exhibited and so was iodide of potash, but nothing seemed to have any noticeable effect on the condition which was characterised by its chronicity

Remarks.—No predisposing factor could be found in any of the three cases, and in one only was an exciting cause suggested Although one case was neurotic the other two were quite normal These cases were asymmetrical whereas when this condition occurs as it so commonly does in women and girls it is almost always symmetrical

The cases were very chronic and showed not the least inclination to go on to suppuration Unlike the same condition obtaining in the female, there were no reasons whatever for supposing that it was in any way connected with the sexual functions

A FULMINATING APPENDICULAR ABSCESS AT SEA

By Staff Surgeon R H McGUFFIN MB RN

This interesting and instructive case is recorded on account of the concealed nature of the disease and the results from early operation

An Officer aged 54 reported himself to the Medical Officer on March 8 complaining of feeling generally "out of sorts" His main symptom was loss of appetite with no relish for the food supplied in the mess No pain was complained of Two days later he complained of pain in the gastric region after partaking of any food The abdomen was examined but found normal The abdominal walls moved freely There was no rigidity or pain on deep pressure in any area and the bowels were normal Temperature was 98 8° F, and the case was thought to be a gastritis and treated as such From the 10th to the 14th inst, patient continued at duty but did not regain his appetite and on the evening of the 14th turned in as he did not feel so well Temperature was normal

On March 14 I joined the ship as Senior Medical Officer and three hours after joining sailed for a twelve days cruise with no chance of being able to send any case to hospital

The next morning 9 a m the Surgeon asked me to see this case, and on examination I found a large well defined mass in the right iliac fossa extending upwards and inwards to a spot about midway between McBurney's point and the costal margin The mass could not be felt *per rectum*. The bowels were normal there was no rigidity of abdominal walls and only slight tenderness was complained of on pressure over the upper and inner edge of the mass Tongue was slightly furred and there was no history of vomiting except that once or twice during the morning gastric contents regurgitated At 10 a m patient's temperature had risen to 101 1 F and his pulse increased to 90 He looked very ill and as the case was rapidly progressive and no port available for twenty four hours I decided that immediate operation was necessary

Permission was obtained to use the captain's lower cabin where under the skylight the operating table was placed and in one hour from deciding to operate the patient was on the table and everything ready to begin Under $CHCl_3$ and ether (administered by the Surgeon) quiet there was produced Assisted by the sick berth steward, I opened the abdominal cavity by the iliac incision (4 in in length and central point 1 in internal to anterior superior iliac spine) The peritoneum was found to be thickened and adherent to the cæcum After enlarging the incision and following the peritoneum downwards I was enabled to find a small area which I could pick up This I opened and with very gentle manipulation managed to free the peritoneum from the cæcum for about 2 in On exploring with the finger (no gloves had been supplied to the ship), the appendix was discovered bound down to the cæcum and running upwards and inwards under the colon which was also bound down posteriorly forming one large mass With great difficulty I separated as much of the cæcum posteriorly from the peritoneum as possible in order to obtain a better view and found the appendix swollen and hard running up into this pocket After plugging the anterior

opening into the abdominal cavity the abscess was opened and a gush of purulent fluid escaped. This cavity was washed out and a large rubber drainage tube was inserted. This was stitched to the skin and was dressed, leaving it open. The patient was removed to the captain's forecastle cabin and a constant watch kept.

Progress.—There was no post-anæsthetic sickness. A four-hourly record of temperature showed that his temperature rose until 8 p.m. when it was 102·4° F., pulse 88, respiration 20; at midnight temperature was 100·2° F., pulse 82; the temperature dropped to 98° F. before removal to hospital. In hospital his temperature remained at or about 99° F. for two days, when it came down to normal. On March 18 the abscess continued to discharge freely but the patient improved daily. On March 27 the tube was removed and all that remains now on April 6 is a small sinus, 1 cm. in length, discharging very slightly.

Commentary on the Case.—Patient was given no enema before operation, and after shaving the pubis an iodine liniment was applied to abdomen. Dressings were sterilized in the apparatus provided, but owing to its small capacity swabs were made from aseptic wool which had been steeped in 1 in 20 carbolic and before use these were wrung out in normal saline. Horsehair and sutures were boiled, as also the instruments. Rubber gloves were not obtainable and their absence was greatly felt. Pituitary extract would have been invaluable in the alternative treatment of this case. If the appendix could have been removed the lack of finer silk sutures and silkworm gut would have made the operation more difficult.

A METHOD OF REMOVING ADHERENT DRESSINGS

By Acting Staff Surgeon A. Vavasour Elder, R.N.V.R.

To remove an adherent dressing of any kind quite painlessly and without setting up hemorrhage from the granulating surface the following method will be found most satisfactory.

The dressing is first thoroughly moistened with water—preferably sterilized. A syringe filled with an equal part solution of hydrogen peroxide (10 vols.) and water is then drawn along one edge of the dressing, the fluid being slowly expelled from the syringe in the meantime.

On coming into contact with the dressing the peroxide solution is decomposed and the dressing is lifted up on the bubbles of gas. The edge of the dressing thus released is raised with forceps and the process repeated until finally the whole has been removed. The advantages of this method are:—

(1) Absolute painlessness and consequent absence of shock or inconvenience to the patient.

(2) There is no hæmorrhage from the granulating tissue to cause adherence of the subsequent dressing as the lifting process is gradual and gentle.

The drawback is the time taken in removing the dressing which is considerably longer than by the ordinary method of moistening and then dragging the dressing off. This however is not worth considering under ordinary routine conditions in hospital.

The effect [illegible] peroxide solution [illegible] previously [illegible] dressing [illegible] ing in the event of a rush of [illegible] it is not anticipated that [illegible] some good results would be obtained in the cushion of [illegible] in for the dressing which lifts it up would not be formed

This method naturally is not applicable to aseptic cases as the peroxide solution is not decomposed to the same extent An ordinary nasal douche nozzle with a 4 oz rubber bulb is a most convenient form of container for the solution

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TWO CASES OF FUNCTIONAL APHONIA

By Temporary Surgeon MICHAEL MASTOMBRES RN
Royal Naval Hospital Haslar

During peace time it was not unusual to meet with cases of so called functional aphonia The form of laryngeal paralysis was from ever in the large majority of cases confined to young females and more rarely to males of unstable nervous temperament

During the unprecedented nerve racking experience of this war however it was found that even healthy adult men under severe mental and physical stress were not immune from this form of neurosis

The following two cases are of interest from many points of view In Case I we have a healthy man of perfectly sound antecedents struck dumb under the influence of shock whilst carrying out such duties as might fall to the lot of any naval rating working in the engine room in times of peace Case 2 deals with a man who became aphonic under conditions indirectly ascribable to the effects of battle shock

In the first case the type of aphonia was the commonest form in which the patient although unable to phonate, was yet able to make himself understood by speaking in a whisper The condition of the second case was one of aggravated functional aphonia combined with paresis of the whole speech mechanism known as functional anarsia or apalthyria Both cases proved very resistant to treatment and both eventually recovered although the methods adopted which resulted in the eventual restoration of speech were different In both cases there is no doubt that suggestion played an important part in reinforcing the will power of the patient and in preparing the ground for the ultimate shock which was to produce speech The process of conversion of silence into speech might be likened to that of a cyclist climbing up a gradient where nearly all the effort comes from the rider and where all that the surgeon is required to do is to give the final push which will enable the cyclist to top the crest and sail down the slope on the other side According to the degree of the shock and the stability of the sufferer's nervous mechanism so must the surgeon wait a longer or a shorter time before his push may become effective

It would seem that in the cases quoted below this push was made either too roughly or too soon The result being a certain amount of physical anguish to the patient with no corresponding advance toward recovery

I feel sure that in many cases the patient would reach his goal unaided—

some treatment [illegible] of an emotional character, such as the unexpected meeting with an old friend, thus affecting the patient's receptive system and providing the adequate stimulus. It would be said of him that he had recovered his voice spontaneously.

In both these cases, electrical and mechanical stimulation of the upper air passages had been tried many times without effect. It has been stated above that suggestion probably plays an important rôle in the treatment of this condition. Case I is an example of how anæsthesia combined with stimulation may succeed where stimulation alone has failed. Indeed cases have been recorded where patients have recovered their speech under the influence of alcoholic intoxication. Whether this recovery was spontaneous or effected as a result of some physical stimulus I do not remember to have seen stated. In addition to the numerous methods in daily use for influencing the patient by suggestion it is conceivable that the following ruse might prove effective. In a base hospital where so many faces are unknown the services of a few would-be aphonics might be secured who in the presence of the true aphonic would regain the voice which they had never lost. Finally, both these patients showed how genuine was their complaint by the intense jubilation and gratitude they displayed when the lost function had been restored.

Case I.—A mechanician, this patient was admitted to Haslar on July 18, 1916, with the following history. On June 1, 1916, he was shifting a valve in the bilge of engine room; steam was put on the steering engine and the drains were opened out. Patient was immediately bathed in steam and some of it entered his throat. He immediately rushed up gasping to the engine room platform and was unable to speak. It would appear that patient's condition was at first regarded in his ship as one of œdema of the larynx, but apart from a slight rawness of the throat, which soon passed away, and from his inability to speak, patient had no other complaint. On July 5 he was discharged to hospital ship "Plassy" and there received seven applications of the faradic current, which caused the patient severe pain without his regaining his voice.

On admission to Haslar, patient was found to be a healthy looking man aged 38, of excellent physique. There were no signs of any organic disease. He was unable to utter a spoken word, but could whisper well and cough fairly loudly. On the day after admission, a laryngoscopic examination was made and the vocal cords and larynx appeared normal. On attempting to vocalize the adduction of the cord could not be completely effected and no sound was produced. On getting patient to cough, however, the cords would for a brief moment be seen to approximate in a normal manner.

It was decided to keep patient in the ward and with rest, tonic treatment and by constantly assuring patient that he would soon regain his voice, it was hoped that the next effort might be more successful. About ten days after admission another laryngoscopic examination was made with mild mechanical stimulation of the upper air passage. This time although no sound was emitted patient informed me that he had never been so near being able to speak before. It was next decided to try the effect of mechanical laryngeal stimulation when the patient was recovering from the effects of anæsthesia. Accordingly the patient was informed that his "muscle of talking" was to be replaced and that

upon his help depended the success of the operation He was recommended to shout out as soon as he became conscious of my working inside his throat

I administered open ether, getting the patient lightly into the second stage As soon as signs of consciousness began to return the laryngeal mirror was placed lightly on to the larynx and the patient commanded and encouraged to count out loud and shout The result was completely successful, and the patient was seen on August 30 and found to be speaking normally

Case 2—A leading stoker, aged 25 this patient was admitted to Haslar with the following history He was in a destroyer in the Dunkirk battle and a shell exploded on deck He was blown into the sea by the concussion of the shell, picked up and taken on board His behaviour on board was apparently abnormal He had delusions that he was being watched and his manner was nervous with twitching of the fingers and a halting speech As he was unfit for duty he was discharged to Queensberry Hospital for treatment on June 23

On the day after admission patient lost his voice The twitching of his arms continued There is no record of treatment having been carried out during his stay

On admission to Haslar on June 29, patient was found to be a healthy looking man, aged 25 He had no recollection of his stay at Queensberry and did not know how he had lost his voice His behaviour was perfectly rational, and apart from his tremulousness and inability to speak there was nothing abnormal about his condition However in view of the history of mental derangement he was warded in the mental block.

On examination there were no signs of any organic disease

During the whole of his stay at Haslar, except on one or two brief occasions when he was found by himself to whisper 'Yes' and 'No' until his final care, patient has not been able to utter a sound either in spoken or whispered conversation

After a week's stay in the mental block patient was transferred to a general ward Both internal and external applications to the larynx of the electrode of a faradic current had failed to produce speech On one occasion very light ether anæsthesia with stimulation of the larynx by electricity had been carried out without effect I saw patient for the first time on July 27 twenty eight days after admission He was quite unable to whisper On examination of the larynx the cords were seen to be quite healthy but held in wide abduction On the patient making an attempt to phonate they would be slightly adducted and then immediately spring apart again Nevertheless after assuring the patient that the cause of his trouble was purely obvious he became very excited and seemed anxious that I should proceed as soon as possible At the next examination the mirror was pushed down on to the larynx and the patient commanded to say "Ah!" This he did loudly and his speech returned I saw the patient again on August 25 He speaks clearly but jerkily, and his general nervous condition is such as to justify him being put on for survey

I am indebted to Temporary Surgeon Hildred Carlill R N for his notes on the above case

NOTES ON A SUCCESSFUL CASE OF TREATMENT BY SUGGESTION

By Fleet Surgeon HUGH S BURNISTON M.B., R.N

These notes may prove of interest to any medical officers who are trying this method of treatment for the many varieties of nervous trouble resulting from the War The only other excuse for recording this case is the extraordinarily rapid result of the treatment

The notes are divided into three parts (i) These kindly sent me by Surgeon Dermot Loughlin of the Royal Marine Infirmary Deal (ii) a short description of the treatment adopted and its result on July 7 (iii) what happened when I saw the man again on July 13

I

A stoker aged 26 On May 22, while his ship was at sea, the man was found in a workshop hidden behind some oil drums and refusing to come out The Medical Officer describes him as dazed not recognizing his messmates suspicious of people with whom he came in contact, and complaining of headache He was discharged to the Royal Naval Hospital St Malo the same day and was received by us on May 24

His physical condition was normal except for rather glib knee jerks To all questions he answered Don t know and shook his head He improved considerably in the next two or three weeks and could answer questions concerning events that had happened since his admission quite rationally He complained at intervals of headache or of a sense of weight in the head A Wassermann test was negative On June 26 I examined him for the first time He said that he had no recollection of anything at all before the hospital at Malo but could remember everything that had happened since He did not know the names of the most common objects unless he had seen them in the ward or grounds When taken into the boiler house he did not know the name or use of a fire rect spanner or pressure gauge but could describe the latter as being made of brass and glass because he said he had seen articles of both substances in the wards He could read and write well but a great many words conveyed no meaning to him He had no conception of the interior of a ship He said he was anxious to return to the Service if he could be of any use His only physical symptom was a feeling of pressure in the head but he appeared anxious and rather depressed as to his mental condition and prospects His condition remained unchanged until his discharge from hospital on July 6

(Signed) DERMOT LOUGHLIN
Surgeon

II

This stoker came to the sick bay at the Royal Naval Barracks Chatham on the forenoon of July 7, bringing with him a note saying briefly what is included in the above and recommending that he should be re trained as a stoker

The man s condition was as follows Physically he was quite normal a well set up man his voice was however monotonous and he looked worried did not know if he had any relations though he stated that a certain person had been to see him who said she was his wife There

was no doubt whatever as to [illegible]ness of the mind condition When asked how he knew [illegible] he said it was on his card could not account for the fact that he could read and write and would undergo any treatment to get well [illegible] In the presence of Fleet Surgeon Mornement the patient was [illegible] to the hypnotic state induced by gazing at the brass knob of the [illegible] light which is generally used Patient went off easily was then told to go to sleep and that there was nothing for him to worry about [illegible] then taken back to the time his illness began and told he could [illegible] what had happened previously he was then asked to say when he joined his ship and what had happened up to date which he did [illegible] surprise at having been in the sick bay before going to Middle East He stated that the trouble was caused by the explosion of bombs from air raids and that after one explosion very close to him he had lost his memory Asked if he was married, he said yes and had a child 1 year and 9 months old While describing the falling of the bombs he looked very worried and I was afraid he would come out of the sleep so put him deeper though at no time was he in the deep hypnotic sleep He was now told that when he wakened up he would remember all that had happened and then ordered to wake up For a few moments he was dazed and then in reply to a question said he was all right When asked if he was married, he said 'of course' and that he had a child He remembered everything perfectly both previous to and since his illness including his efforts to learn while at Deal

On the following morning he went on four days' leave with orders to report on his return

III

On July 18 the patient reported himself in the sick bay stated he was quite well and able to remember everything and had been quite well while on leave but was only troubled by a headache which he had suffered from ever since he could remember and which was the result of a fall when a child — so he had been told Thinking it worth while to follow the case out he was again put into the hypnotic state and asked if he could remember the accident which caused his headache he replied — no He was then as it were conducted back through the years and again asked if he could remember He at once described a white house in India mentioning the name of the town and how he fell down the area, saying he saw black people in white clothes and that his head was cut and bleeding The patient was now told that he would have no more of these headaches and that when he wakened he would be perfectly well He was then told to awake, and on being questioned said his headache was gone, and repeated the story of how the accident had happened

July 20 — Patient states he has been free from headaches since July 18 and is perfectly well August 2, patient states that he feels better than he ever felt in his life having got rid of his chronic headache September 1, perfectly well drafted to a sea going ship

AN OUTBREAK OF MEASLES IN H.M.S. 'TIGER'

By Fleet Surgeon JOHN R. MUIR, R.N.

An epidemic of measles attacked the ship's company of H.M.S. 'Tiger' during the months of March and April 1916 and as will be seen on reference to the table appended there was a total of twenty-four cases, sharply divided into two series. The first series lasted from March 15 to 29, with fourteen cases and the second series—evidently the result of infection by the first—from March 30 to April 8, with ten cases.

Source of Infection.—By a process of exclusion one can be fairly certain that the disease was brought on board by civilian workmen, but this cannot be definitely proved. The men attacked in the first series of cases were widely separated, both by their messes and duties, and no common employment or amusement as a possible source of infection could be traced. At first it was thought that the landing parties or the loading room (in which shore workmen were occasionally massed) might be at fault, but some of the first series, from which alone the source of contagion can be argued, never used the reading room and many of them never went ashore at all. Friendly or working intercourse with the civilian workmen was common to all the ratings on board, as they used the same smoking and recreation spaces and their duties brought them in contact with all kinds of ratings. There were plenty of opportunities of being infected from the shore as the disease was rife in the villages around our base. There was a certain number of shore workmen employed on board the ship when the epidemic broke out, but all of them had had recent exposure to the disease. As the infection had taken place at least ten or twelve days before the disease was recognized, and as the shore workmen on board were pretty frequently changed, it is possible that the source may not have been on board when these men were employed. At the same time there was also a certain number of cases on board other ships in the Squadron, but infection from them was very unlikely as the quarantine regulations were very strict and there was very little communication between the ships.

Incidence of the Disease.—It will be noted from the table how scattered the epidemic was—in fact it would have been impossible to separate them more effectually if one had tried. In only two messes, No. 35 boys' and No. 14, stokers', was there more than one case. In No. 35 mess the three cases came from separate tables. In the second series attention is called to the fact that in only three messes was there a recurrence of the disease which speaks well for the efficiency of the isolation and disinfection routine which was carried out.

Type of the Disease.—In ten cases of the first series and seven of the second the disease was typical measles with symptoms of marked coryza, roseolar crescentic rash first appearing round about the roots of the hair face and neck, moderate temperature and slight general disturbance. In the remaining cases the subocipital glands were enlarged and the coryza and general disturbance were not such marked symptoms, the whole affection being much milder. These may have been cases of rubella, but no attempt at differential diagnosis was made. Except in one case in which the temperature was 103°.8 when he left the ship, none of the cases was of a severe type and there were no complications such as pneumonia, &c.

Number of Mess	1	1	13	14						7	58	45	21			5	9	1			1	—
Hall																						Remarks
March 15	—			—							1					—						
16			1	1			1				—	—									—	First series 14 cases
17	—	—		1	—					1				—					—		1	Ship placed in state of quarantine
18	—		—										1	1							—	
19	—	—			1			1		—			—	—		—					—	
20		1														—						
May 1	30			—														1			—	Second series 10 cases
	31											—									1	
April	1															1						Quarantine period expired April 14
		1						1		—								—				
	4	1																				—
	4							—			1		—									—
												1		—							—	—
	8			—				1									1				—	
Total	1		1	—	1	1		1		1	3	1	1			1	1	1	1		1	Total 14 cases

General Precautions [illegible] taken in dealing with the epidemic [illegible], but it [illegible] realised that the possibility of their being effective depends [illegible] the thoroughness with which they are carried out —

(1) Immediately after the fourth case or the second day the ship's company was mustered and medically inspected

(2) The men were warned in a speech by the Captain of the first symptoms of the disease and ordered to report themselves at the sick bay at once if they should suffer from colds however slight or any kind of skin rash

(3) As many of the men as could be mustered without seriously interfering with the work of the ship were mustered at divisions and inspected daily and medically inspected for fourteen days

(4) Bedding and hammocks were aired as frequently as the weather and ship's duties allowed

(5) More stringent precautions were taken during ventilation rounds to see that fans were running and that the trunks had not been tampered with. All natural means of ventilation were utilized to the utmost. Hot air was ordered from 9.30 to 11 a.m. in order to thoroughly dry and warm the mess decks

(6) Whenever it was possible the mess decks were scrubbed more frequently and wiped over with izal

(7) All dockyard workmen employed on board were closely interrogated as to the possibility of their having been recently exposed to the risk of infection

(8) Cases attached with the disease were rigidly isolated and discharged to hospital at the first opportunity

Precautions taken in Infected Cases —

(1) Every effort was made at the early diagnosis of any subsequent cases

(2) The mess was mustered daily for medical inspection for fourteen days from the date of last exposure to infection

(3) Ratings in the mess who had been in contact with cases came to the sick bay where they got an izal bath and dressed in clean clothes. All their other clothes were passed through the disinfector

(4) All hammocks and bedding were passed through the disinfector

(5) Mess places were scrubbed out with strong izal solution including mess stools tables and mess traps immediately after detection of case. Subsequently the mess place was sluiced with izal daily after the usual wash down

(6) Lockers belonging to infected cases were emptied and all gear sent with the case to hospital. The locker was sterilized with izal

Apparently these precautions were completely successful and it is satisfactory that in a ship's company of whom much the larger proportion is under the age of 25 years the second series only consisted of ten cases. Unfortunately as the average measles case has his most infectious period for at least a couple of days before the disease is likely to be recognized a second series of cases is inevitable but it lies in the hands of the medical officer I think to make sure that the second series is as limited as possible and that there is practically no third series. The biggest danger of all is an unrecognized case, and only very careful inspection of the ship's company can avert that risk

[illegible] MOCOCCAL MENINGITIS

[illegible] STRONG AND SHAND RN

The [illegible] the practice of this hospital [illegible] cases of cerebro spinal fever are occupied up to the first that recovery was apparently complete [illegible] disease (*see* Allbutt and Rolleston's System of Medicine

The [illegible] in connection with the case was carried out by Tempo[illegible] Gimblett

A drue[illegible] Naval Division was admitted on April 9 with the following [illegible] He had been under observation at the camp for five days with [illegible] headache and pyrexia the temperature varying from 100° F to [illegible] On the morning of the 9th he vomited several times and appeared very drowsy For the first time he complained that his eyesight was not so good as a week ago His tongue was dry and furred—pulse [illegible] On the abdomen are several rose spots He resists slightly any attempt to elicit Kernig's sign The case presents features of enteric and tuberculous meningitis but is more like enteric

On admission he stated that he had had a sore throat shortness of breath, and a morning cough for several weeks He complained of mild pain and stiffness in the legs The knees were kept flexed and reluctant Kernig's sign was elicited Head retraction was marked Several spots were to be seen on the abdomen but were in no way characteristic There was no change in either optic disc His mental condition was clear and he answered questions readily Temperature 102 4 F pulse 88 respirations 24 He coughed up a little tenacious blood stained sputum but no abnormal signs were discovered in his chest His bowels had been opened He was isolated A lumbar puncture was done Cerebro spinal fluid was under considerable tension and was turbid 30 c c were drawn off Twenty c c of Flexner's polyvalent anti meningococcic serum were injected The findings of the cerebro spinal fluid were as follows —

(1) On staining a centrifuged specimen with Leishman's stain many polymorphonuclear cells were seen but few organisms and those which were present were Gram positive (2) No tubercle bacilli were present (3) No growth occurred on Nocgar's medium The culture was kept in the dark and placed in a bath at 37 C in the laboratory after taking until it was transferred to the incubator This culture was not made from centrifugalized fluid

He was given calomel 5 gr and ordered a mixture of urotropin and acid sodium phosphate That evening he felt better Temperature 100 4° F pulse 88 On the following morning Kernig's sign was absent—neck was still stiff but headache less Patient's mental condition was good He had a slight cough and some tenacious sputum which was found to contain a large number of Gram positive diplococci

Widal's test was negative in dilutions of 1 in 40 and 1 in 100 He had never been inoculated On April 12 a lumbar puncture was again done, more for diagnostic purposes The fluid was not under tension and was quite clear

(1) With Leishman's stain a smaller number of polymorphs and about the same number of Gram positive diplococci, which were extra cellular

(2) A culture [illegible] on centrifugal [illegible] on trypsin broth, leguimin agar. A [illegible] with of Gram [illegible] lanceolate diplococci was obtained after [illegible] hours. A Widal test was again negative.

Temperature [illegible] symptoms subsided. Knee joints returned on April 26 and [illegible] and their normal strength. A throat swab showed only [illegible] bacteria present. He was discharged from hospital on April 30 apparently [illegible] well.

NOTES ON A CASE OF REDUCIBLE EXOPHTHALMOS

By Lieut.-Surgeon Hollis, R.N.

Fig. 1.—Normal appearance.

This accompanying photographs illustrate a case of reducible exophthalmos recently under treatment on board. The patient a stoker petty officer, aged 38 could produce the phenomenon at will, and by gentle manipulation could reduce it

He first attracted my attention one morning at Sunday [illegible] his anæmic and somewhat old appearance and by the [illegible] of his infra-orbital vein During a subsequent conversation he told me he could make his eye come out of its socket whenever he chose and I unfortunately added that he frequently performed this feat for the edification of his shipmates Noting my look of incredulity he thereupon bent

Fig 2 Right exophthalmos

his head down between his knees and after a few seconds presented a typical exophthalmos of the right eye A few deft touches with his fingers and the eye was replaced in its socket

His history was that eight years ago he had contracted a severe attack of syphilis accompanied by a considerable loss of flesh to such an extent that at one period he only weighed 88 lbs —his normal weight being about 10 stone Six years later he became aware of this peculiar

obtainable [illegible] No [illegible] or inconvenience resulting [illegible] be had [illegible] without reporting it

Vision [illegible], and ophthalmoscopic examination revealed normal fundi [illegible] was no evidence of any intracranial or orbital tumour No [illegible] could be felt over the eye and no bruit heard on auscultation [illegible] which might have suggested an orbital aneurysm or an arteriovenous anastomosis The other cardinal symptoms of exophthalmic [illegible] were absent, and there were no manifestations present indicating [illegible] disturbance in the normal secretions of the thyroid

The affection was presumed to be the result of absorption of the orbital fat with [illegible] of fluid which gravitated into the back of the orbit through the sphenoidal or sphenomaxillary fissure probably the result of a specific lesion The diagnosis was confirmed after making an exploratory incision through the nostril, with an Hard's sound, when a small quantity of dark coloured muco purulent material escaped

The treatment consisted in restricting the movements of the eye by means of a small even lying truss, the internal administration of potassium iodide and intramuscular injections of calomel cream

By the end of the fourth week the specific lesion had apparently been entirely absorbed as the exophthalmic condition could no longer be produced

I am indebted to Captain Medico Umzilotti oculist to Ospedale della Croce Rossa Italiana for performing the rhino exploratory operation

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NOTES ON A CASE OF ERYTHEMA INDURATUM SCROFULOSORUM

By Staff Surgeon T B SHAW M B R N

As this skin affection, sometimes known as Bazin's disease is comparatively rare the following account of a case recently under treatment in H M S "Falmouth" may prove of interest

The patient a Chief Petty Officer aged 36 complained on January 30, 1916 of boils on the back of the right thigh These he stated had been present for some days, but he took no notice of them as he thought they would soon disappear

Previous History.—About eighteen months ago he complained of cough and loss in weight Nothing definite then could be found in the lungs and examination of the sputum was negative He is naturally thin, his usual weight being about 138 lbs Two sisters and one brother died of consumption There was no history or sign of venereal disease

He was kept under observation and under treatment with cod liver I gained in weight, and remained fit and well until he complained of the boils

On examination two septic ulcers each about the size of a shilling were seen on the back of the right thigh disposed horizontally about two inches below the gluteal fold Their bases were foul their edges a little raised, red and inflamed Clinically they appeared to be just two foul sores following boils which had burst and been neglected

Borie fomentations were ordered thrice daily A week later there

[illegible] no signs of healing, the ulcers [illegible] was now ordered twice daily [illegible] improvement

On February 20 the ulcers were [illegible] circular inflamed areas had now developed in the [illegible] lower borders of each ulcer

The condition was now thought to be tuberculous and [illegible] boric fomentations were tried The lesions however remained [illegible] and showed little improvement

On February 26 patient complained of small lumps in the thigh near the ulcers He had noticed these a few days ago and now stated that he had felt small lumps before the old sores came On inspection nothing could be seen except a slight violet discoloration of the skin to the inner side of the ulcers On palpation an indurated band ¾ in broad and 14 in long could be felt extending horizontally inwards from the edge of the internal ulcer To the inner side of this band, and extending it as it were horizontally inwards to 24 in were several definite nodules varying in size These were oval in shape the largest being about the size of an almond They were freely movable under the skin and in size and consistency resembled very closely lymphatic glands There was no tenderness on pressure

It was evident now that we were dealing with a case of erythema induratum scrofulosorum a skin affection first described by Bazin, and characterized by the formation, usually on the backs of the legs or thighs of chronic inflammatory subcutaneous nodules which tend to coalesce and form bands of induration, and later break down and form ulcers

Syphilis could be absolutely excluded in this case and at no time did the ulcers at all resemble those due to specific disease The patient was sent to hospital on March 1 The disease is said to occur more frequently in those whose occupation entails much standing This causative factor was present in this case the patient, a guard, having to spend long hours daily on the foot on the bridge

Two types of the disease are sometimes described a tuberculous and non tuberculous From the history of this case it is almost certainly of the former variety

Extracts from Official Journals.

Deputy Surgeon General W. J. Collonel writes with regard to the Operating Room on board —

The Room is a fine large and commodious compartment. It is tiled and has good light and ventilation by side scuttles. It was found however by practical experience whilst operating with the ship rolling that the tiles are slippery and that one is in constant fear of falling. I consider that corticene with a covering of shellac would meet the case, for although a tiled floor may be necessary where the room is in constant use as in a man of war where it is only used occasionally it does not seem necessary. Moreover it is very cold so that the room cannot be used as an emergency ward. The operating table has been placed in slots in the middle of the room; this is not quite satisfactory as the table cannot be moved with safety so as to take advantage of the daylight from the scuttles. I think it would be better if the table was not fixed but provided with removable rubber feet.

Surgeon G. D. G. Ferguson writes on a Visit to the Wreck of the "Emden."

In November we went down to the Cocos Keeling Islands in order to examine and search the wreck of the "Emden." It was anticipated that

The "Emden" aground.

some corpses would be found with the wreck as the "Sydney" had not been able to deal with them owing to military reasons and also because it was necessary to transport the large number of Germans wounded quickly to

hospital On board we found thirty or forty corpses in advanced stages of decomposition and the duty of getting rid of them to enable the working parties to do their jobs in comfort fell upon me Before leaving Singapore I had purchased rubber post-mortem gloves With four volunteers (armed with chain hooks and shovels) who were not allowed to handle the corpses on any consideration whatever any such handling required being done by myself we disposed of them all into the sea without any mishap and buried them later when they floated

[illegible]

ashore As there was a large working party on board and everything was more or less permeated with [illegible] from the bodies I had [illegible] of disinfectant in various places about the ship and made [illegible] wash his hands at intervals on returning on board this ship I made them wash both hands and feet in a solution of [illegible] and am glad to say I had no cases of blood poisoning or septic wounds It was almost impossible to tell except in the case of [illegible] what had been

the cause of death in most of the bodies owing either to the [illegible] ted condition or advanced state of decomposition but so far as I could see most of the injuries were in the upper part of the body especially the head The 'Emden' itself was very much knocked about and burnt out completely aft. It astonished me to see the amount of damage a 6 in shell could do The sick bay which is right in the bows of the ship was absolutely untouched It contained four cots, a small office and dispensary combined, was fitted out with an extraordinary variety of tabloid drugs and was very well found in instruments of every description

Fleet Surgeon EDWARD COLPER writes on the Action off the Falkland Islands —

At 4 15 the "Scharnhorst" was sunk and at 6 p m the Gneisenau also went down All three of our ships then steamed to the spot to pick up survivors The sea had been calm all day but by this time there was a very choppy sea which rendered the work of rescue difficult Our whaler was engaged but the crew managed to right it and our boats picked up forty survivors including two officers In the meantime, the sick bay and the flat outside had been got ready for their reception and we had a busy time resuscitating them, by means of hot blankets brandy, bovril and rubbing Seven died soon after being brought on board from exposure as the water was very cold about 42 but the remainder completely recovered after varying intervals I believe the total number saved was about 150

Fleet Surgeon E T BURTON writes on the Treatment of Venereal Diseases in the German Navy —

During the visit of a division of the Second Battle Squadron and three ships of the First Light Cruiser Squadron to Kiel in June 1914 I took the opportunity of calling on the Medical Officer in professional charge of the Lazarett (or Venereal Hospital) at Kiel Wick whom I had met some years previously at Portsmouth The information obtained from him may be divided into three headings (1) prevention (2) treatment during the acute stage (3) subsequent treatment

(1) PREVENTION

This is carried out in a similar manner to that in our own Navy Protargol however is used instead of argol and a solution of perchloride of mercury in place of calomel ointment These preparations are now supplied free of charge to the ship's companies but at one time the men were compelled to purchase them at a small cost from an automatic machine before going ashore The name of each man who goes to the sick bay for a precautive is noted and should a case of venereal disease develop this list of names is referred to as evidence whether he provided himself with the outfit Should he have neglected to do so he receives three days' punishment, which I learned might be increased to five days at the request of the medical officer

(2) TREATMENT DURING THE ACUTE STAGE

Unless the ship is away from a port no cases are treated on board, but are all sent to the lazarett

—The treatment of this disease appears to be carried out
Several courses are given the number depending on
the disease and the manner in which the patient reacts
The first course consists of six injections of salvarsan
three to five days the initial dose is usually 0·3 gram and
0·4 to 0·45 gram for subsequent doses The patient is
the first few doses which are always given intravenously,
have been noted Salvarsan (old) is now used
results of neo salvarsan were found to be unsatisfactory
with the salvarsan the patient is given twelve intra-
doses of calomel in oil Mercurial cream is not used as
irritation of the muscle and the formation of hard
frequently result and patients are liable to intoxication
absorption of accumulated injections of the metallic
not found with calomel The Wassermann reaction
blood and also with the cerebro spinal fluid,
puncture, and the latter is also examined micro-
daily At the end of the first course provided that
symptoms, the man is discharged to his ship and kept
on his stay in hospital having been about a month

(*b*) —All cases are sent to hospital if the ship is in a home
port Simple cases are treated with urethral injections of silver nitrate
No irrigation treatment is carried out Should sequelæ such as epi-
didymitis or synovitis occur, local treatment is suspended and the
patients are treated with intravenous injections of collargol which I
am told has excellent results, an inflamed testicle or joint becoming
painless at the end of twenty four hours A microscopical examination
is carried out in all cases

(3) Subsequent Treatment

After discharge from hospital syphilitics have an interval of about
a month, and are then re admitted for a second course of six injections
of salvarsan and twelve of calomel Those courses are continued at
intervals until not only the blood but also the cerebro spinal fluid give a
permanent Wassermann reaction The medical officer states that in
many cases after the blood has given a permanent negative Wassermann,
he can obtain a strong positive reaction with the spinal fluid and that it
is these cases which are so liable to syphilitic nervous conditions such as
ataxic tabes dorsalis and paralytic dementia Consequently, these
tests are carried out as nearly as possible once every year and further
courses of salvarsan and calomel injections are given as necessary He
states that cases of general paralysis of the insane if taken at an early
stage are amenable to treatment, and he showed me one case originally
affected with pupillary and bulbar as well as mental symptoms which
had completely cleared up as the result of treatment He has records of
several other similar cases In all of them the blood gave a negative and
the cerebro spinal fluid a positive Wassermann In all cases of nervous
syphilis the injection of salvarsan is given into the spinal membranes—in
the same way as stovaine for spinal anæsthesia, but the dose is much
smaller than when given intravenously and he had had no cases which
had developed serious symptoms A complete detailed record of all
cases treated at the hospital is kept

Reviews.

The Biology of Tumours. By C Mansell Moullin, M.A., M.D. Oxon., F.R.C.S., Lieutenant Colonel, R.A.M.C.(T.), Consulting Surgeon to the London Hospital late Vice President Royal College of Surgeons, Fellow of Pembroke College and Radcliffe Travelling Fellow, Oxford. London: H. K. Lewis and Co. Ltd. 1916. Pp. 50. Price 2s. 6d.

In this work the biology of tumours is dealt with more thoroughly by the author than he was able to do in the Bradshaw Lecture delivered before the Royal College of Surgeons in 1912, and also his object is now to place the origin and classification of tumours upon a scientific basis.

Tumours are divided into two classes according to their mode of origin, one class due to the sudden awakening of the innate reproductive power of the tissues in virtue of which they give birth to buds which grow into tumours, and the other due to details of structure not being carried out as completely as they ought to be. In other words, his hypothesis is that all tumours except those due to defects in structural development originate in the latent power of direct or asexual reproduction, a power which can be demonstrated in some animals and is possessed by some of the simplest forms of animal life. The buds may arise from germ or somatic cells whose development has been arrested, all that is necessary being the presence of some stimulus, mechanical or chemical, to arouse the latent reproductive power into activity. He draws no distinguishing line between malignant and other growths, malignancy being an accidental feature of all growths and of no fixed standard in his view, it is a chemical feature only. Tumours due to the revival of the primitive power of asexual reproduction include the vast majority both simple and malignant. Their character whether malignant or not depends on the stage the parent cell has reached when its development is arrested, and upon this depends the forms that these tumours may assume: a form that grows fast or a form that grows slowly, a form that remains circumscribed and limited, or a form that retains its embryonic character istics, spreads in all directions and invades other organs.

The basis of the deduction is put before the reader in a clear and scientific manner and the book is extremely interesting. Though the conclusions arrived at may differ in many particulars from those generally accepted, who can say at the present time that they are not correct? If they are true, it would seem that we must first know the intimate chemical changes which occur in the cell during its development, in fact almost the origin of life itself, before we can treat the malignant new growth with any ultimate success.

The Sexual Disabilities of Man. By Arthur Cooper, M.R.C.S., L.R.C.P. Consulting Surgeon to the Westminster General Dispensary, formerly House Surgeon to the Male Lock Hospital. London: H. K. Lewis and Co., Ltd. 1916. Pp. viii + 227. Price 6s. net.

In this third edition of his work first published eight years ago the author has revised, enlarged and otherwise improved the text. The

[illegible]esent edition is divided into [illegible] of which the first three are devoted to (1) Sterility in the Impotence [illegible] and the whole of the original book is [illegible] into two parts the third part being entirely new

Part I deals with those [illegible] depend on some defect in the seminal fluid [illegible] which prevents its proper discharge

In the first chapter the [illegible] is considered, in the next two the physical qualities and quantitative changes are respectively discussed, changes in the [illegible] death at the time of emission the [illegible] and the [illegible] congenital or acquired [illegible] In Chapter IV the [illegible] sterility occupies the closing chapter of this first section of the book and resolves itself into removable [illegible] a group [illegible] a given case

Having by the aid of this book acquired a sound knowledge of the different causes the reader will find that the treatment in most cases is obvious

Part II deals with defects in the apparatus concerned in the act of copulation the physiology of the sexual function being first considered and in successive chapters various departures from the normal are passed in review the last two chapters of this section being devoted to general and local treatment of such defects The author here impresses on his readers the importance of two hygienic conclusions that the sexual trouble is primary until the secondary or symptomatic forms of disability have been excluded

In Part III the subject of prevention of sexual disability is arranged in three chapters, the first of which includes the prevention of abnormal sexual indulgence and the second that of total abstinence which includes sexual excitement produced by salacious literature pictures or conversation while in the last two chapters the author briefly touches on the important questions of sexual perversion and venereal diseases in so far as they concern his theme

We know of no other text book in which these disabilities and their treatment are discussed [illegible] fully or with such discretion as in this volume

The importance of the subject to medical officers who have to teach men sexual hygiene cannot be over estimated

Surgical Anatomy By John A C Macewan, B Sc M B C M Fellow of the Royal Faculty of Physicians and Surgeons (Glasgow Senior Assistant to the Regius Professor of Surgery Glasgow University Surgeon to the Elder Hospital Govan Assistant Surgeon to the Royal Infirmary Glasgow and to H M H Princess Louise Hospital Roseneath late Civil Surgeon South African Field Force Captain R A M C (T) Hon Surgeon to the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers Second Edition London Baillière Tindall and Cox 1916 Pp xvi + 535 With 77 illustrations coloured and plain Price 10s 6d net

The second edition of this book is a considerable advance upon the first A special section on surface anatomy is now prefixed to each division forming a very useful addition the text has been thoroughly

revised [illegible] up to date many sections [illegible] been entirely rewritten [illegible] remarkable amount of new matter and numerous fresh illustrations [illegible] been added Though this has entailed an increase in the number of pages the publishers are to be congratulated in preserving [illegible] the former size of the book a size very convenient for [illegible]

[illegible] arrangement there has been no material alteration the [illegible] divided as before into five sections head and neck [illegible] brain and spinal cord thorax abdomen and pelvis [illegible] and upper extremity The author's object is to set [illegible] the anatomical facts of importance to the surgeon with [illegible] to their surgical bearing and to the physiology of the [illegible] surgical import To deal with so large a subject in a work of [illegible] a difficult task but on the whole the information [illegible] complete On many points the teaching is dis[illegible] school and his method of surveying the anatomy [illegible] the abdominal instead of from the external surface has [illegible] The majority of the illustrations are from other [illegible] well chosen but a considerable number are [illegible] and instructive particularly No 29 a [illegible] wall from behind and No 47 a diagram [illegible] of the pelvic and perineal fasciae

[illegible] close reading as naturally the text is somewhat [illegible] owing to the space at the author's [illegible] edition compares favourably with any work of [illegible] subject

THE T[illegible] OF [illegible] OF THE SKIN By W Knowsley Sibley M [illegible] B C [illegible] M R C P Lond M R C S Eng Physician to St [illegible] Hospital for Diseases of the Skin President of the [illegible] late Physician to the North west [illegible] Hospital London Edward Arnold 1916 Pp 307 With [illegible] Price 6s net

The [illegible] edition of this little book was published in 1913 and the [illegible] produced in order that the new scientific methods of [illegible] of the last four years has been so fruitful may be placed [illegible] general practitioners and students A new [illegible] has been [illegible] numerous fresh paragraphs under [illegible] have been [illegible] and short sections on treatment [illegible] of skin affections [illegible] to be found in the present edition [illegible] special prescriptions in Part III have been revised the [illegible] to the metric system have been arranged in a column [illegible] to each drug and a list of skin diseases for which they are [illegible] each prescription

[illegible] a description of the uses to which X rays radium [illegible] high frequency currents, carbon dioxide snow [illegible] put with best advantage

[illegible] is dealt with separately and in alphabetical [illegible] is facilitated

[illegible] the author advocates the regulation of sexual [illegible] the laws of nature and says that unnatural abstentions [illegible] Such advice seems to need amplification to avoid [illegible] misunderstanding

[illegible] annual photographs of [illegible] demonstrations [illegible] The volume would form a very [illegible] addition [illegible]

THE [illegible] PUBLISHED IN FORRAINE ATTEMPTS OF THE ENGLISH NATION [illegible] Reproduced in facsimile with introduction and notes by [illegible] Singer Oxford At the Clarendon Press 1919 [illegible]

Captain [illegible] tells us that this quaint little work is the earliest devoted [illegible] al or naval medicine published in English and according to [illegible] ably the first of the kind in any language The pamphlet now [illegible] in facsimile has at the British Museum and is believed to be [illegible] copy Its origin is somewhat obscure but the editor advances sound evidence to prove that it was written by George Whetstone a typical Elizabethan gallant and man of many parts poet soldier and [illegible] Whetstone who travelled in the West Indies and suffered much misadventure in Spain uses old Spanish terms such as calenture (heat stroke) [illegible] dilla (typhus or yellow fever) espinilas (prickly heat) and [illegible] as [illegible] (dysentery) Though not a physician some of the remedies he suggests are quite reasonable especially in regard to sanitation in the light of what was known at that period His reasons for publishing the pamphlet in his own words are In the expeditions of our time to the Southern parts from whence in this and former age the English have returned with renowned victory yet exceedingly oppressed with extreme and pernicious sickness that hath made more provident the proceeding and performing of their pretensions than the power of enemies Captain Singer writes a most interesting introduction and appends scholarly notes on the text

EFFICIENCY IN FIRST AID (A MANUAL OF AIDS FOR SENIOR STUDENTS OF FIRST AID) By N Corbet Fletcher B A M B B C Cantab M R C S L R C P Lond Lecturer to the Colleges of Ambulance Regent Street Polytechnic L and N W and S E and C Railway Ambulance Centres Lecturer and Examiner to the St John Ambulance Association and the British Red Cross Society London John Bale Sons and Danielsson Ltd 1916 Pp vi + 200 Price 1/ net

This book is supplementary to Aids to First Aid by the same author and is intended mainly for senior students of first aid in their work and examinations and also is an incentive to persevere in their studies until [illegible] of efficiency A high standard of knowledge is accepted but the teaching throughout is very sound Provided the student has a good knowledge of the principles and practice of first aid a careful study of this little work is bound to increase his efficiency It is of a size convenient for the pocket

HOME NURSING IN FEW WORDS By J M Carvill M R C S L R C S A Lond London John Bale Sons and Danielsson Ltd 1916 Pp 14 Price 2d (paper) 4d (cloth)

This little book is in the form of a folder for the pocket and contains much essential information as the title implies in a few words It should prove a very useful reminder for Red Cross and nursing students and for all interested in the subject of home nursing

Abstracts.

T[illegible] Nature Manner of Co[illegible]
[illegible] Paralysis The subt[illegible]
[illegible] Y rk Academy of Medicine [illegible]
[illegible] Rockefeller Institute for Me[illegible]
Yo[illegible]

This [illegible] to a minute filterable micro[illegible] [illegible] has [illegible] visible under the higher powers [illegible], and is [illegible] present in the central nervous syst[illegible] of the [illegible] nasal and intestine less frequently in the [illegible] and not in the blood of patients The difficult[illegible] its [illegible] microscopical identification render[illegible] [illegible] detection [illegible] but its presence can be [illegible] [illegible] which develop the disease In this [illegible] [illegible] mon healthy contacts has been proved [illegible] though usually the virus does not persist [illegible] [illegible] weeks The virus leaves patients and [illegible] in the [illegible] nose throat and intestines and it is [illegible] transmit the disease The virus enters the body es[illegible] [illegible] chiefly by way of the mucosa of the throat and nose, [illegible] transmitted by coughing, sneezing, kissing and by [illegible] mucous nasal and intestinal discharges Experi[illegible] [illegible] paralytic diseases in domestic animals and pets differ [illegible] paralysis and that these animals do not convey the [illegible] infection is due to human contact The virus [illegible] drying high summer temperature or even to weak [illegible] The incubation period varies from two days to two weeks [illegible] usually not more than eight days The severity of [illegible] varies and the mortality may be from 5 to 20 per [illegible] cent The virus is also subject to fluctuations in its [illegible] children and relatively few adults are susceptible to [illegible] The degree of susceptibility is infinitely less than in [illegible] nasal diphtheria As there is no safe method of [illegible] and as the disease rarely spreads in hospitals [illegible] the means of prophylaxis Since serum [illegible] [illegible] therapeutic agents the best treatment is by [illegible] Unfortunately the amount of human immune serum [illegible] [illegible] are the only animals capable of providing this [illegible] serum is the only drug which both exerts a germi[illegible] [illegible] injected into the cerebrospinal fluid but experi[illegible] [illegible] down to be ineffective in the early stages only of [illegible] to modify and improve this drug are as yet but [illegible]

H D R

[illegible] The Serum Treatment of Acute Poliomyelitis *Journa*[illegible] [illegible] Chicago 1916 vol lxvii, pp 683 4

M[illegible] that recover from experimental acute poliomyelitis cannot be re infected and their blood and also that of human beings who have recovered from that disease contain anti bodies which neutralize the virus

[illegible] poliomyelitis [illegible] which monkeys [illegible] by the poliomyelitis [illegible]. The immune [illegible] by lumbar puncture into the [illegible] space. These [illegible] therapy in man [illegible] yet in so early [illegible] encouraging [illegible] five cases [illegible] recovered completely from the [illegible] previously [illegible] makes the [illegible] should be [illegible] from a healthy [illegible] a positive Wassermann reaction and who [illegible] a very remote period so as to insure [illegible] high [illegible] bodies as possible, the serum [illegible] must [illegible] be given as early as possible and [illegible] 5 to 20 c.c. according to the age of the patient [illegible] intrathecal injection of [illegible] being performed and a suitable amount of cerebrospinal fluid being first removed. H. D. R.

WRIGHT (B. L.). The Treatment of Pyorrhoea Alveolaris and its Secondary Systemic Infections by Deep Muscular Injections of Mercury. *Medical Record*, New York, 1916, vol. lxxxix, pp. 807–811.

At the Navy Yard, Portsmouth, N. H., seventy-five cases of pyorrhoea alveolaris, forty one with secondary systemic infections such as arthritis and lumbago, were rapidly and completely cured by intramuscular injections of succinimide of mercury ([illegible] dissolved in hot sterile water) every seventh day. The largest number of injections necessary was seven, the fewest one, and the average three. Local treatment, the expression of pus, removal of stumps and tartar and the application of equal parts of tincture of iodine, tincture of aconite and chloroform was also employed.

The author, a surgeon in the United States Navy, believes that mercury is parasiticidal for all vegetable parasites; that during the first few days of an infection it directly destroys the parasite, and that at later stages it stimulates the production of antibodies. In support of his thesis he quotes the cure by mercury of streptococcic infectious puerperal septicaemia, and of cases of acute rheumatism resistant to salicylates. Although he admits that the *Endamoeba [illegible]* is present in all cases of pyorrhoea, he doubts if it be the cause for it is never found in the blood or in the secondary infections, but should it eventually be proved to be so, he considers that mercury must be regarded as a more powerful amoebicide than emetine. H. D. R.

IRVIN (S. V.). Umbilical Concretions. *Johns Hopkins Hosp. Bull.*, Baltimore, 1916, vol. xxvii, pp. 187–8.

Among 108 admissions to all services of the Johns Hopkins Hospital there were three cases each of umbilical abscess, two of which were certainly and the other probably due to an umbilical concretion. These concretions, rare in childhood or advanced age, are commonly seen in middle aged males of uncleanly habits with an unusually deep umbilicus and are generally composed of friable sebaceous material often containing cotton or wool fibres or even pieces of wood or stone. Some concretions, however, are firm, brown and smooth or pearly in appearance. The first

symptoms is severe pain in the umbilical region followed about three days later by a red and indurated swelling, varying in size from that of a pea to a hen's egg. fluctuation then appears, and after excruciating pain there is a gush of blood stained pus. If the concretion is retained the discharge persists, and the diagnosis from a suppurating dermoid cyst arises. H. D. R.

WELSH (D. A.) AND BROWN (W. S.). The Intensive Specific Treatment of Epidemic Cerebro-spinal Meningitis. *Med. Journ. of Australia*, 1916, vol. ii, pp. 113-117.

Out of twenty-eight cases treated from the outset by intensive measures two only proved fatal, and these from intra-cranial pressure unrelieved by lumbar puncture. Within the first twenty-four hours in bad cases eighteen or twelve hours not less than 60 c.c. of serum must be given intrathecally. On the third day lumbar puncture is always necessary, but not serum unless the patient is very ill, or the initial treatment has been delayed. Then 15 c.c. should suffice. On the fourth day lumbar puncture and serum (15 c.c.) are advisable. On the fifth day lumbar puncture but not serum is indicated, and on the sixth lumbar puncture and serum (15 c.c.) may be required. After this recovery should be uninterrupted, except that lumbar puncture may be necessary. In septicæmia subcutaneous injection of serum should be given in addition. The serums used were those of Parke, Davis and Co., Burroughs Wellcome and Co.'s, and one made by Dr. Bull of Melbourne, and were found to be so germicidal that cultures from the cerebro-spinal fluid were negative after one or two injections. Relapses, not uncommon in ordinary treatment, are due either to (1) recrudescence of infection, the result of insufficient initial treatment, or (2) to reinfection from the oesophagus, hence the importance of early disinfection of the throat. A relapse should be treated in the same way as the primary attack. Some form of anæsthesia should always be used for lumbar puncture. With this form of treatment the success of anti-meningococcic serum is comparable to that of anti-diphtheritic serum therapy. H. D. R.

LAUBACH (G. A.). The Possible Rôle of Books in the Dissemination of the Contagious Diseases. *Johns Hopkins Hosp. Bull.*, Baltimore, 1916, vol. xxvii, pp. 183-186.

Although diphtheria bacilli may cling to inanimate objects for some time, and although the spread of diphtheria has been popularly attributed to the handling of books previously used by diphtheritic patients, this latter event has never been proved by the isolation of the diphtheria bacillus from such books. The author examined 100 books, from fifty houses in which diphtheria existed by means of cultural tests and animal inoculations with a negative result. Examination of seventy-five books which had been in constant circulation among children in elementary homes showed that the majority of the bacteria found on the books belonged to the chromogenic group corresponding to the species usually present in atmospheric air, in no instance was the diphtheria bacillus isolated. Pathogenic bacteria can seldom be isolated from books used by the sick, but since virulent diphtheria and typhoid bacilli can be recovered from artificially infected books after long periods, books used by patients should be thoroughly disinfected. H. D. R.

[illegible] B[illegible] BRADLEY [illegible] W.) The Transmission [illegible] in Dengue [illegible] fasciata *Med. Journ. Australia* 1916 vol [illegible] 200-203.

In [illegible] 1916 dengue [illegible] prevalent [illegible] some of the towns on the north [illegible] of New South Wales This opportunity to investigate the mode of [illegible] dengue was welcomed more especially because it [illegible] the infective agent (a mosquito) was conveyed to a locality [illegible] the disease was not indigenous, experiments [illegible] free from the fallacies due to contemporaneous [illegible] cases of the disease This plan would therefore [illegible] that employed in Syria by Graham, in Brisbane by [illegible] in the Philippine Islands by Ashburn and Craig, by whom *Culex [illegible]* was regarded as the carrier of dengue—which the authors of this paper regard as improbable The following are their conclusions (1) *S. fasciata* mosquitoes caught in a dengue infected district and some of them known to have bitten a dengue patient in the first and second days of his illness were transported to a non-dengue locality (Sydney) and fed on volunteers four out of seven of these persons developed dengue Blood from three out of the four successful cases was injected into further volunteers who developed dengue the blood of the fourth case was not tested (3) The incubation period of the disease in the four cases was probably between six and a half and nine and a half days (4) No known cases of contagion occurred in connexion with any of the four cases (5) No evidence was obtained from two cases, one of which was repeatedly and heavily bitten by *C. fatigans* that *C. fatigans* [illegible] as a transmitter of dengue In discussing the results of their experiments the authors point out that the mosquito after biting a dengue patient might not be able to infect another person until after some period had elapsed Hence collected mosquitoes might not prove successful transmitters because they were not ripe They did not try to solve the question of the ripening period if any or of the period during which the mosquitoes remain infective The paper is illustrated by charts showing the temperature and character of the leucopenia of dengue and by a coloured plate of the rash in one of the infected volunteers.

H. D. R.

KILGORE (A. R.) Peripheral Neuritis following Emetine Treatment of Amoebic Dysentery *Boston Med. and Surg. Journ.* 1916 vol clxxv, pp 380-383

In China the occurrence of peripheral neuritis after hypodermic injections of emetine is more frequent than is generally recognized very possibly because the tendency in that country is to give rather larger doses than that (1 gr daily for seven to ten days) originally suggested by L. Rogers and others From a review of his own cases and those reported by others the author finds that peripheral neuritis often appears after the emetine injections have been stopped and that it may become progressively worse even though no more injections are given but that the ultimate prognosis is good and that no permanent disability is left behind The amount of emetine given to cases that developed neuritis has varied from 21 gr in an adult to 4 gr in a child, but cases which have received as much or more than those attacked by neuritis may be

unaffected Among [illegible] cases [illegible] four being under 5 years of age and the eldest [illegible] attained the largest amount (6 gr.) of emetine H D R

Fraser (H) The Bacteriology of Dysentery Malaya [illegible] hes from the Institute for Medical Research Federated Malay States 1916

In 1914 there were 5 982 cases of dysentery treated [illegible] provincial hospitals of which 1 129 died and deaths the same per [illegible] were reported under head of dysentery and diarrhœa or 13 1 per cent of the total deaths This shows how important the subject is from a public health point of view

From the hospital at Kuala Lumpur amœbæ were found in 240 cases of 819 cases of dysentery 63 of these were examined bacteriologically and dysentery bacilli were only found twice One hundred and fifty two cases of non amœbic dysentery were examined bacteriologically and dysentery bacilli were isolated from 72 Shiga type in 8 cases and [illegible] fermenting organisms in 14 cases The author considers that these cases can not be divided into [illegible] as their [illegible] tions tend to vary from time to time and the agglutination reaction [illegible] unsatisfactory for differentiation He also states that the disease caused by the mannite fermenting dysentery bacilli does not differ from that associated with the *Bacillus dysenteriæ* (Shiga)

For the treatment of bacillary dysentery he recommends sensitized [illegible] (the method of preparation is not stated) preferably autogeneous P W B S

M Watson (J C) A Note on Salonika Fever *Med Press and Circ* N S vol 9 1916 vol ci N S No 1931 pp 122 123

The author who has had considerable experience with the Forces in the Eastern Mediterranean draws attention to a very severe fever at Salonika of indefinite duration attended with marked prostration and [illegible] a high mortality The disease is described as a [illegible] malaria and typhoid aggravated by broncho pneumonia [illegible] blood and all parasites are generally present It is stated that the [illegible] of enteric malaria and pneumonia found at *post mortem* [illegible] are much less marked than the clinical symptoms had indicated The Peters patches may be affected or even ulcerated but the spleen is not markedly enlarged In some cases signs of chronic dysentery were present The fever runs on periodically and some of the more severe types have been taken for sunstroke

The author lays much stress upon the unfavourable predisposing causes which are present in the trying climate general mental and physical depression and the constant supply of food deficient in vitamines as he puts it "Where patients have been living for ten or twelve months on bad dusty insanitary environment on canned beef cooked in the canned soup canned jam dry biscuits canned milk canned rice and chlorinated water and you take them to hospital where they get canned milk freeze beef limeade chickens frozen rabbits and tinned fruits it is difficult for the blood to become charged with that fresh abounding vitality which would enable it to shake off a fever

Quinine was found to be the most useful drug but did not appear to act as a specific

(The malarial fevers which abound around Salonika are chiefly due to the malignant type of parasite and pernicious symptoms are common—malaria, sunstroke, dysentery, &c. and from previous experience I know that these cases are often very resistant to quinine and difficult to cure. It is probable that the greater number of these cases are malaria occasionally complicated with typhoid.)

P. W. B. S.

Wiggins (L. L.) The Value of Quinoidine in Malaria. *Indian Med. Gaz.* September 1916 vol. xi. No. 9 pp. 335 with 3 charts.

Quinoidine which is a colloidal substance remaining from cinchona bark after removal of the crystallizable bodies has been distributed very largely to Government institutions and missionaries from the Alipur Juvenile Jail for some years. In 1913 the author recommended the use of this drug and no less than 3,500 lbs. have been sent out since. The reports received from various sources as to its value in malaria have generally been favourable, except that of Major Macculchan who asserts that it is the least effectual of all cinchona products. Its quinine was however found on only eight or nine cases, which is small in comparison with the experience of the number. Owing to its slight solubility it is not so useful for very severe cases but for ordinary routine in large dispensary practice would be attended with an enormous financial saving. The drug is made up in 2 gr. and 1 gr. tablets they are soluble in rectified spirit and glycerine but precipitate on addition of water; each dose should therefore be freshly prepared. In acute cases 12 to 16 gr. daily are sufficient but a preliminary purge should be given.

(1) Quinoidine is slightly more toxic than quinine to guinea pigs but possibly less lethal to protozoa.

(2) It is cheaper 4 rupees a pound against 24 to 50.

(3) It is when properly administered nearly as effective as quinine and probably is no cinchonism or gastric trouble.

(4) It is widely used in India.

P. W. B. S.

Stanziale (R.) Experimental Researches on the Bacteriology of Leprosy. *Int. Jour. Med. and Surg.* September 1916 vol. x. No. 2 pp. 161–167.

Professor Stanziale gives a short resume in English from his previous papers in Italian and German of the work he has been doing at Naples since 1911 on the etiology of leprosy.

Inoculation experiments were made with mice guinea-pigs rabbit and monkeys. He was able to infect rabbits by inoculating them with leprous tissue in the anterior chamber of the eye and from these he was able to pass the disease on through two generations but the percentage of successful inoculations decreased at each passage. A rod fast organism like Hansen's bacillus and similar to that cultivated by Kedrowsky from human lepers was obtained from a rabbit on the 196th day after inoculation this grew well but he was not able with it to infect animals. The author states that under definite experimental conditions leprosy can be communicated to rabbits but that many failures and incomplete results must be expected the investigator should be very patient and not draw conclusions too hastily as has so often been done when studying this disease.

P. W. B. S.

News of the Service.

CASUALTIES.

[illegible] —Surgeon Probationer A. L. Strachan, R. [illegible]

[illegible] The following Officers were killed in [illegible], with [illegible]

[illegible] Ward.
[illegible] C. H. Gow.
[illegible] G. A. Walker.
[illegible] wounded [illegible] Surgeon F. B. Fisken.
[illegible] Surgeon J. N. McB. Ross.

OFFICERS MENTIONED IN DESPATCHES.

War Office, October 11, 1916.

In the Lieutenant-General Sir [illegible] Lake's despatch dated August [illegible]

[illegible] Officers brought to special notice:—
[illegible] Surgeon F. Camoro, M.B.; Surgeon F. G. Hitch, M.B.

War Office, November [illegible], 1916.

The [illegible] names are added to the list of Officers mentioned for distinguished [illegible] General Sir Ian Hamilton's despatch [illegible] 11, 1916:

[illegible] A. T. R[illegible]; Staff Surgeon C. J. Cole Stanford, M.B.; Temporary [illegible]

PROMOTIONS.

[illegible] promoted to the rank of Staff Surgeon [illegible] R. J. [illegible]; John H. Burdett; Albert A. J. Richardson, M.B. [illegible] M.D.

[illegible] Officers [illegible] promoted to the acting rank of Staff [illegible] Francis [illegible] H. R. Black, M.D.; William [illegible]

[illegible] M.V.O., promoted to rank of Deputy [illegible]

[illegible] W. [illegible] promoted to Staff Surgeon, dated November 14, 1916.

[illegible] promoted to acting rank of Staff Surgeon, dated November 14 [illegible]

[illegible] Schofield, M.B., [illegible] promoted to rank of Fleet [illegible] November [illegible] 1916.

APPOINTMENTS.

[illegible]

[illegible] Surgeon [illegible] to the [illegible] H. R. [illegible] M.B., to [illegible] M.B., to the [illegible] F. Bolster, M.B., B.A. [illegible] as Assistant Medical Transport Officer [illegible] T. D. Holahan [illegible] C. K. Matthew to the Arrogant. [illegible] H. W. [illegible] Grange to the [illegible]

Staff [illegible] M.B., to the [illegible] H. L. Page to the New[illegible] W. W. D. Chil[illegible] to the Blanche. [illegible] David Knight to the Weymouth. J. [illegible] John [illegible] M.B. [illegible] J. D. [illegible] to the Vengeance. M. T. [illegible] M.B. [illegible] W. W. Hayden [illegible] A. S. McKaig[illegible] to the Goliath [illegible] the Pembroke, addl. T. W. [illegible] to the [illegible]

to the Wedge W. S. Adams [illegible] D. G. P. Bell D.S.O. to the [illegible] Hildebrand P. C. Arnold to the [illegible] Whitehall Cooke to the Pelo[illegible]

Gen[illegible]

Deputy Surgeons General G. T. [illegible] M.B. to Malta [illegible] to Haslar Hospital J. H. Stephou[illegible] M.D. [illegible]

Fleet Surgeons [illegible] Reed [illegible] Bermuda Hospital H. B. [illegible] Artillery [illegible] J. H. Fergusson to [illegible] the Hibernia [illegible] Raymond M.B. [illegible] Cooper to Greenwich College [illegible] M.B. to the [illegible] to the Neptune [illegible]

Staff Surgeons [illegible] Connell M.B. B.A. [illegible] D. D. Turner to the Devonshire [illegible] M.B. [illegible]

Surgeons A. C. [illegible] M.B. [illegible] Pembroke [illegible] to Haslar Hospital [illegible] to the Pembroke addl. [illegible] to the Victory addl.

Staff Surgeons [illegible]

[illegible]

to the Q [illegible] to Haslar Hospital B [illegible] Hospital
D J Mus [illegible] added

Surgeon [illegible] R N V R, D S Musgrave, to the [illegible] W [illegible] to the Marguerita [illegible] ut to the Wallflower R [illegible] Sanderson [illegible] to the
S H Waddy to the [illegible] J A Gale to the Mallard E J G [illegible] ight to the
Camellia J Allan to the Myrtle W [illegible] Robinson to the Melpomene [illegible] William
to the Nonsuch [illegible] the Minerva to the Diligence [illegible] ointed to the Hawke A
Ord to the Foresight [illegible] Morgan to the Millbrook [illegible] Woodhouse to the [illegible]
A P Birdwhistle to the [illegible] Brig J J Nicholson to the Impregnable [illegible]
the Headlam T Mirfield to the [illegible] Sir Stanley to the Spitfire [illegible] Mantle
to the Bonetta, J Stone, Mate, to the Hotspur, [illegible]
Nepaul [illegible] Wilmshurst to the Swift [illegible]
G P Walker to the Thrasher [illegible] Chichester to the Sylvia [illegible]
W L Wallace to the Armstrong [illegible] Lonsdale to the [illegible] Hospital
to the Devonshire [illegible] to the Hawke [illegible]
Johnson [illegible] to the Indus [illegible] to the Impregnable [illegible]
to the Pitt [illegible] to the Royal Sovereign [illegible]
[illegible] to the Hercules [illegible] to the Hospital [illegible]
Paste to the [illegible] [illegible] Rattray to the
Royal Sovereign to the Victory [illegible] to the Pembroke
Mansfield [illegible] to the Victory [illegible] Lodge to the Victory
the Orlando [illegible] to the Victory [illegible]
to the Pembroke [illegible] to the Royal Sovereign
the Musketeer

NOTICES

Deputy Surgeon [illegible] to the Victory [illegible] to the Hospital
Edgell Smith, [illegible] to the Victory [illegible] to the Haslar Hospital
the Ajax [illegible] to the Victory [illegible]
[illegible] to the Victory [illegible]
Peace to the [illegible] Hunter [illegible] to the Victory [illegible]
to the Victory [illegible]

Staff Surgeon [illegible] to the Victory [illegible]
Chemist [illegible] to the Victory [illegible]
Victor added [illegible] to the Victory [illegible]
the Victory [illegible] to the Victory [illegible]
added [illegible]

Surgeon [illegible] to the Hospital [illegible]
the Widgeon [illegible] to the Victory [illegible]
Hunter [illegible] Rank to the Victory [illegible]
Hospital [illegible] to the Victory [illegible]
Hospital [illegible] to the Victory [illegible]

Staff Surgeon [illegible] to the Victory [illegible]

Surgeon [illegible] to the Victory [illegible]
Thalia [illegible] to the Victory [illegible]
Headquarters [illegible] to the Victory [illegible]
Station

Temporary Surgeon [illegible] to the Victory [illegible]
added [illegible] to the Victory [illegible]
Hospital [illegible] to the Victory [illegible]
Barrosa [illegible] to the Victory [illegible]
MB to the Victory [illegible]
Hospital [illegible] to the Victory [illegible]
Indus, R A [illegible] to the Victory [illegible]
the Wedding [illegible] to the Victory [illegible]
Lion, A H Rule, to the Victory [illegible]
W H Sam [illegible] to the Victory [illegible]
R N Sick Quarters [illegible] to the Victory [illegible]
T C Summers [illegible] to the Victory [illegible]

[illegible]

ADMIRALTY ORDERS ISSUED FROM SEPTEMBER 1, 1916, TO DECEMBER 8, 1916

(Only the more important Orders, pertaining directly to the duties of Medical Officers afloat and [illegible] are included.)

2443.—Medical Stores.

Salvarsan.

(M.D. 3078/16.—21.9.1916.)

[illegible] has been added to the authorized scale of [illegible] allowed for Submarines.

Medical Officers [illegible] should [illegible] from their Naval Medical Depots [illegible] quantity to complete their [illegible].

2565.—Hurt Certificates.

(M.D. [illegible]—[illegible] 1916.)

[illegible] Medical Officers [illegible] Art. 1318 K.R. and A.I. [illegible] Hurt [illegible] to furnish Hurt Certificates [illegible] all officers [illegible] the officers and men [illegible] Destroyers and Trawlers, &c.

[illegible] Medical Officer in Charge [illegible] Hurt Certificate [illegible] Charge [illegible] the Ship to which the patient belongs [illegible] the Medical Officer in Charge [illegible] hospital.

2172.—Candidates for Coding or other Non-Combatant Work: Medical Examination.

(C.W. 1142.—[illegible] 1916.)

When examining candidates for posts as [illegible] officers or for other specialized [illegible] Medical Officers are to make certain—

(1) That the candidates are totally unfit for general service.

(2) That notwithstanding certain physical disabilities they are personally fit for the special duties they wish to enter for. And

(3) [illegible]

[illegible] the Service.

2514.—Accumulator Pocket Lanterns for Medical Officers.

[illegible] Dockyards [illegible]

(N [illegible] 16.—6.10.1916.)

The approval to supply Accumulator Pocket Lanterns, pattern 3181, for the use of medical officers in H.M. ships is extended to apply also to [illegible].

One Lantern will be supplied to each medical officer borne, and [illegible] forwarded in the usual manner from any [illegible] not already supplied.

2518.—Methylated Spirits for Sterilisers.

Destroyers.

(N.S. [illegible] 16.—6.10.1916.)

The following addition to the establishment for all Depot ships for Destroyers has been approved, viz.:—

[illegible] 107. Spirits [illegible]. Monthly allowance [illegible] attached Destroyer in which a Medical Officer is borne.

[illegible] Demands from Depot ships should be forwarded in due course to the [illegible].

2706.—South African R.N.V.R. Medical History Sheets.

(N/M [illegible].—[illegible] 10.1916.)

The [illegible] of the ratings of the South African Division Royal Naval Volunteer Reserve [illegible] supplied with Medical History Sheets.

[illegible]

2761.—Hospital Treatment—River Tyne.

(M [illegible] 16.—[illegible] 1916.)

[illegible] North and South Shields [illegible] Medical Officer of H.M.S. "Satellite" [illegible].

(C.M.O. [illegible] 1916.)

2865.—Bacteriological Examinations.

Ships in Scottish Waters.

(M.O. [illegible]/17.—3.11.1916.)

The R.N. Hospital, [illegible], Edinburgh, [illegible] all the bacteriological work [illegible] H.M. Ships [illegible] Scottish Waters.

2833.—Drinking Water: Measures to Ensure Purity.

(M.[illegible] 1916.)

[illegible] will not be supplied [illegible].

(2) The directions in M.O. [illegible] 1916 [illegible] Chloride of Lime should [illegible].

(3) [illegible] 100 gall. [illegible] Chloride of Lime [illegible] Naval Store [illegible] Dockyard [illegible].

(M.O. [illegible] 1916.)

(M. [illegible] 1916 [illegible].)

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2965.—History Sheets of R.N.V.R. Ratings—Disposal

(N. 58686.—10.11.1916.)

The History Sheets (Gunnery, Torpedo, Signal and Wireless Telegraphy) of Royal Naval Volunteer Reserve ratings discharged from the Service are to be sent to the Admiralty Volunteer Committee, 47 [illegible] Street, S.W., for custody and disposal. The Medical History Sheets of such men [illegible] to be sent to the Director General, Medical Department, Admiralty, as hitherto.

(Arts. 581 (d) and 611 (3 and 4), K.R. and A.I.)

3031.—Medical Transport Office, Hull

(M.D. 1464/16.—10.11.1916.)

[illegible] particulars of the Medical Transport Office, Hull, are [illegible]:—

(1) [illegible] postal address.—Medical Transport Office, 90 Morpeth Street, Hull.

(2) Telegraphic address.—"Medtrans," Hull.

(3) Telephone number.—Central 602.

3251.—Scabies—Treatment

(M.D. 13735/16.—1.12.1916.)

[illegible] of all medical officers is drawn to the necessity of a [illegible] for [illegible] in which all the patients [illegible] are generally longer and [illegible] effective [illegible] carried out.

[illegible] treatment [illegible] Transfer [illegible] Surgeon Probationers [illegible]:—

(1) [illegible] bath (1 to 200) [illegible] then [illegible] strength of 1 in 8 [illegible]

[illegible]

(3) [illegible]. The [illegible] should [illegible] twelve [illegible]

(4) [illegible] patient is to take another [illegible] before (see par. [illegible]) [illegible] be sent to duty on the following morning.

3252.—Galyl Injections in Hospital Ships

(M.D. 131[illegible]/16.—1.12.1916.)

[illegible] that all patients [illegible] ships sent to Hospital Ships [illegible] galyl and [illegible] the correct dose [illegible] in all instances, unless from medical reasons it is undesirable [illegible] grounds the alteration [illegible] intervals should be [illegible] Senior Medical Officer of the ship to which the man belongs [illegible] treated as [illegible]

Routine to be Adopted

[illegible]

[illegible] should be 0.4 gm. of galyl.

[illegible] should be [illegible] ordinary state.

[illegible] further [illegible] should be given after three [illegible]

[illegible] in Hospital Ships [illegible]

[illegible]

3346.—Surgeon Probationers, R.N.V.R. Passage, &c., Expenses on Demobilization

(M.C. 2431.—8.12.1916.)

[illegible] when demobilized in order that they may [illegible] the repayment of any passage [illegible] through [illegible]

3307.—Wassermann Test—Information to Accompany Blood sent for [illegible]
(M.D. [illegible] 1916.)

When blood is sent to Hospital [illegible] as to the Wassermann [illegible] Medical Officers are to forward also the following particulars:—

(1) Name of patient with [illegible] to which he belongs.
(2) Whether blood is sent for diagnosis [illegible]
(3) Probable date of infection [illegible]
(4) Present symptoms or lesions [illegible]
(5) Original symptoms or lesions [illegible]
(6) Nature and amount of treatment [illegible] the patient. Whether [illegible] [illegible] of treatment [illegible] the date when [illegible] [illegible]
(7) [illegible] results of former blood [illegible] performed.
(M.D. [illegible])

OBITUARY

Killed in Action

Surgeon John Scott Ward was killed in the Battle of the Ancre [illegible] while serving with the Naval Division. Born in July 1881, [illegible] the Rev. J. W. Ward, Chaplain R.N., he was educated at [illegible] and the Royal [illegible] Surgeon [illegible] Edinburgh [illegible] professional subjects. He qualified L.R.C.P. [illegible] L.R.C.S. [illegible] He entered the Royal Navy in May [illegible] [illegible] the Imperial Medical [illegible] radiography [illegible] the [illegible] Medicine and Surgery [illegible] [illegible] September [illegible] [illegible] Hospital at [illegible] March [illegible] [illegible] September [illegible] [illegible] Naval [illegible] personal [illegible]

Temporary Surgeon Charles Humphrey [illegible] was killed in the Battle [illegible] Ancre [illegible] November [illegible] while serving with the Royal [illegible] Hampstead [illegible] St. Bartholomew's Hospital [illegible] [illegible] M.R.C.S. [illegible] L.R.C.P. [illegible] appointed [illegible] Hospital [illegible] September [illegible] Naval [illegible] [illegible]

Temporary Surgeon [illegible] was killed in the Battle of the Ancre [illegible] November [illegible] while serving with the Naval [illegible]

Died